Excavating Engineer

founded 1906

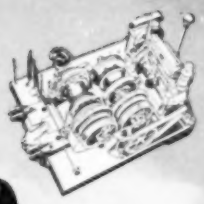
SULPHUR WILL BE MINED in this south-of-New Orleans marshland by 1953. Here the barge-mounted walking dragline of J. Ray McDermott & Co., Inc., Harvey, La., digs borrow for levees. They will hold the fresh water supply needed in the "mining by melting" process. Article begins on page 12.

AUGUST 1952

Now...

DESIGN SIMPLICITY

counts more than ever...



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From boom point to treads, the advanced engineering of Bucyrus-Erie excavators shows up in neat simplicity all along the line. They're trim and compact, have no excess weight; this means easy handling, fast operating. With lightness they combine great strength; this means low maintenance, real dependability. Machinery is conveniently arranged, accessible; this means it's easy to keep a Bucyrus-Erie in top working condition.

This basic design simplicity pays you extra dividends in big output and long service life. Today, with critical materials for new equipment in short supply, that's more important than ever.

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How to Make Your Excavator Work Harder . . . Last Longer

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- Lubrication
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HYDROCRANE - HYDRODIGE

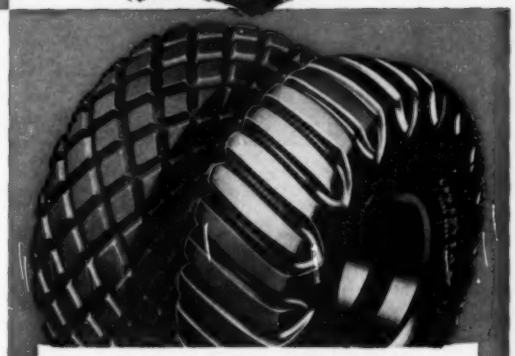
Most Compared-
Most Preferred

When the job calls for PULL

SURE-GRIP
Drive-wheel traction champ
for graders and scrapers.

here's the FIRST CHOICE tire

Sure-Grip in name, sure-grip in action—that's why this long-lasting Goodyear tire is the top favorite on earth-moving operations everywhere for drive wheels. Its specially engineered O-P-E-N C-E-N-T-E-R tread and extra-massive, balanced lugs are what make it the traction champ. *And cost-wise construction men know it.*



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ALL-WEATHER
Finest for flotation, rolling big loads faster

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Super-tough champ for all kinds of rock work

Sure-Grip, All-Weather—T. M.'s The Goodyear Tire & Rubber Company, Akron, Ohio

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ROEBLING is the best known name in wire rope. That's partly because we were the first wire rope maker in America. But more than that, we've always led in developing better wire and better rope for every purpose.

Today's Roebling Preformed "Blue Center" Steel Wire Rope is the best choice for efficiency and long life on excavating and construction equipment. This rope has *extra* resistance to crushing and abrasion . . . stands up under rough going. It saves you time and cuts costs.

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Excavating Engineer

founded 1905

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President, Addressograph-Multigraph Corporation

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Every payday nearly seven million men and women—among them a large percentage of Addressograph-Multigraph employees—give substantial expression of their faith in America by putting $140,000,000 into U.S. Defense Bonds.

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Payroll savers are serious savers. Since May, 1951, through April, 1952, E Bonds maturing totaled $2,345,000,000. But, only $593,000,000 of these matured bonds have been presented for payment. 75% of these matured bonds are still held by their purchasers.

As President of one of the first companies to install the Payroll Savings Plan when it was presented to industry in 1942, Mr. Brainard also appreciates the benefits that accrue to a company that has a Payroll Savings Plan with more than 60% employee participation. In company after company, absenteeism has gone down, the accident rate has fallen off and production has gone up as employee participation passed the 60% mark.

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When it's built for digging like this...

You can be sure of high output in any kind of digging

BUILT for the tough jobs, it handles the easy jobs more easily. Built for rock it gives greater output in softer "going".

If you have a *real* Rock Shovel—a Northwest Rock Shovel, you are ready for anything your job may uncover. The Northwest Dual Independent Crowd makes handling the "big ones" easier and gives a fast, sure pass through tough shale without time-consuming, stuttering, second starts to fill the dipper. The "Feather-Touch" Clutch Control assures easier operation and smoother control without the complications of pumps, compressors, tanks, tubing or other delicate mechanism.

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These are only the high points that make the Northwest a real Rock Shovel. You should know about Northwest Crawlers, Northwest Machinery Bases and Side Frames, Northwest Convertibility and other Northwest advantages. These features mean better output in any digging.

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SHOVELS • CRANES • DRAGLINES • PULLSHOVELS

Allis-Chalmers AD-40

FIRST WITH BUILT-IN

You will do more and better work, do it easily and safely with the new Allis-Chalmers AD-40 motor grader. One big reason is the new built-in hydraulic power steering system—another Allis-Chalmers first in the motor grader field. The AD-40 is specifically *designed* to use this advanced system which retains the accuracy and roadability of mechanical steering . . . and adds the ease and smoothness of hydraulic steering. What's more, the hydraulic power steering unit is *inside* the head casting, with a short shaft to eliminate "spongy" steering. And hydraulic lines are enclosed in the frame . . . fully protected from external damage. See what HYDRAGUIDE®, the outstanding new power steering system, does for you on these jobs . . .

ditching is fast, accurate, complete. Hydraulic power goes to work for you the instant you start to turn . . . does most of the steering work for you. As a result you can turn far easier, far faster . . . work right up to culverts, poles or other obstructions before turning out.

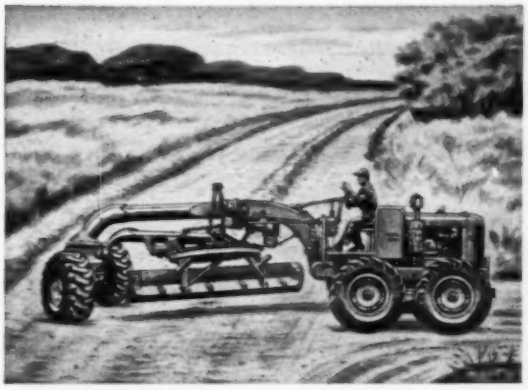
plowing snow — always a tough job due to added front-end weight of either blade or rotary unit—becomes much simpler . . . much more accurate when hydraulic power steering goes to work for you.

muck, sand, soft ditches are back-breakers no longer. Thanks to power steering, you pilot the wheel rather than wrestle it. Because of it, you can blade and turn at the same time.

See your Allis-Chalmers dealer for the full story

the Newest, Finest line on Earth . . .

MOTOR GRADERS
A NEW KIND OF POWER STEERING



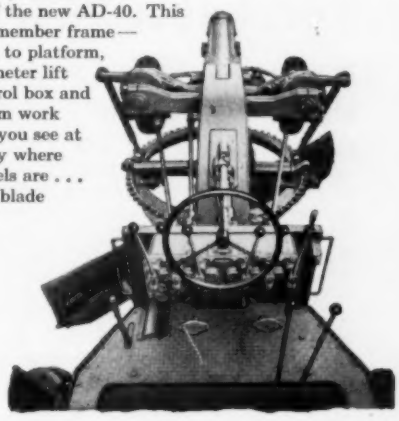
turning around is quick, easy, safe. With built-in power steering you can turn with just one finger—even while stopped. Fast, precise control greatly cuts down interference with moving traffic . . . gives you safe command even on dangerous mountain turns.

bank sloping is easier with the AD-40. Power steering gets you into position fast . . . lets you operate on steep slopes without the tiring "wheel fight" you've always known before. In addition, ease of control assures a smooth, even grade on every job.

holes and bumps cause no "wheel kick" because this new system cushions shock . . . keeps jolted front wheels from "steering back" at you. You turn only when you want to turn.

you get full visibility, too!

Here's the view you have from the platform of the new AD-40. This grader's single-member frame—from front axle to platform, its smaller diameter lift cases, low control box and tapered platform work together to let you see at all times exactly where your front wheels are . . . just what your blade is doing.

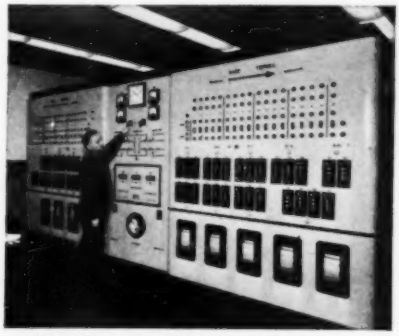


ALLIS-CHALMERS
TRACTOR DIVISION — MILWAUKEE 1, U. S. A.

ENGINEERING REPORTS:

CONTINUOUS-LINE FLUORESCENT LIGHTING—key feature of Brooklyn-Battery electrical system—gives safer, shadowless illumination. Variable light intensity and lower operating costs are other important features.

WELL-LIGHTED APPROACHES lead to tunnel. In daytime, lighting inside the entrance is brighter to provide better transition from sunlight.



CENTRALIZED CONTROL permits one man to operate the complete electrical system—lights, fans, pumps and safety equipment.

Ribbons of light mean safer, lower-cost tunnel operation

Fluorescent lighting, central control, reliable power highlight G-E system at Brooklyn-Battery Tunnel

Now handling 16,000,000 vehicles a year with safety, comfort, and operating economy, New York's Brooklyn-Battery Tunnel provides an excellent example of modern tunnel electrical systems. Designed by engineers of the Triborough Bridge and Tunnel Authority and General Electric, this electrical system was the first to feature economical, variable-intensity fluorescent lighting. Centralized control and a coordinated power distribution system also contribute to operating economy and dependability.

Tunnels are just one of the many types of heavy construction projects on which General Electric is ready to assist your engineers or consultants in electrical system planning. Contact your local G-E Apparatus Sales Office. General Electric Co., Schenectady 5, N. Y.

660-24

RELIABLE POWER—a necessity for tunnels—is provided by G-E metal-clad switchgear. G.E. also builds fan and pump drives for tunnels.

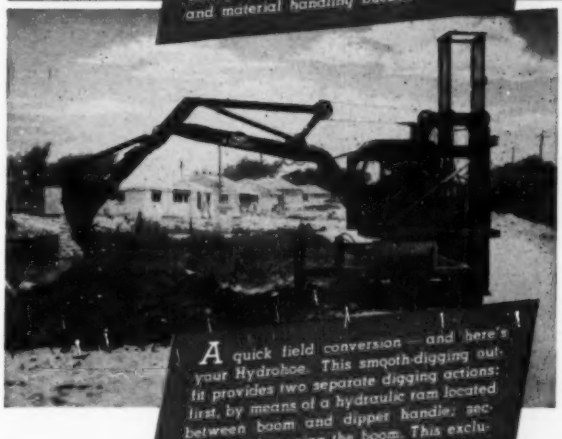
Engineered Electrical Systems for Heavy Construction

GENERAL ELECTRIC

Here's Double Quick [illegible]tibility

Hydrocrane to Hydrohoe in less than 4 hours

HERE the Hydrocrane digs a manhole. Every operation fully hydraulic — boom hoist, line hoist, swing, boom telescope, outrigger set and retract and bucket close. Available with crane hook, magnet, grapple, catch basin cleaning bucket and material handling bucket.



A quick field conversion — and here's your Hydrohoe. This smooth-digging outfit provides two separate digging actions: first, by means of a hydraulic ram located between boom and dipper handle; second, by telescoping the boom. This exclusive telescope feature eliminates moving truck back and forth when digging out boulders and excavating across pipe and cable — permits digging a level, scalloptree trench.

For high-speed front-end convertibility, the Bucyrus-Erie Hydrocrane heads the list. The J. P. Construction Company, Chicago Heights, Ill., reports converting from crane to dragshovel front-end *in less than four hours* — with only the operator and one other man.

Here's How This Owner Does The Job — First the crane boom is lowered onto two specially-designed tripods. Necessary fittings are disconnected and the truck driven away. Next, truck is backed up to the dragshovel front-end which is held parallel to the ground by means of another tripod and the Hydrohoe dipper resting on the ground. Fittings are connected and the Hydrohoe is ready to begin work. Converting back to crane front-end is equally simple.

The owner remarked that the crane's fast convertibility not only means time saved on his own jobs, but it permits crane rental without fear of lost time converting back to the attachment needed on his own work.

Get full details on the fast-working, fully hydraulic Hydrocrane and Hydrohoe. Send the coupon today.

Bucyrus-Erie Hydrocrane Division

South Milwaukee, Wisconsin

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Please send Hydrohoe literature ☐

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increases hourly yardage output over 10% with Koehring *fast-shuttling* DUMPTORS

THERE is no need to turn at the loading unit, along narrow haul roads, or on the fill with fast-shuttling 6-yard Dumptors. Koehring constant-mesh transmission gives the same 3 fast speeds forward and reverse, lets Dumptors operate with equal ease in both directions. Every turn saved cuts 15 seconds off your cycle time, and adds up to an important increase in yards hauled per hour. Here's a typical example:

On a 1,000-foot haul, eliminating only 2 turns saves ½ minute every round trip. Where you would get an average of 13.6 trips per hour with 2-turn operation, Dumptor *no-turn shuttle hauling* gives you 15.4 trips — an increase of 1.8 trips an hour on the same 1,000-foot haul.

Fast, easy spotting and 1-second gravity dump help keep production high. Costs stay low because there are no complicated, mechanical body hoists to slow up haul cycles — no expensive hoist maintenance or down time to eat into your profits. Let your Koehring distributor show you Dumptor's many other cost-cutting advantages.

KOEHRING COMPANY, Milwaukee 16, Wis.
Subsidiaries: JOHNSON • PARSONS • KWIK-MIX

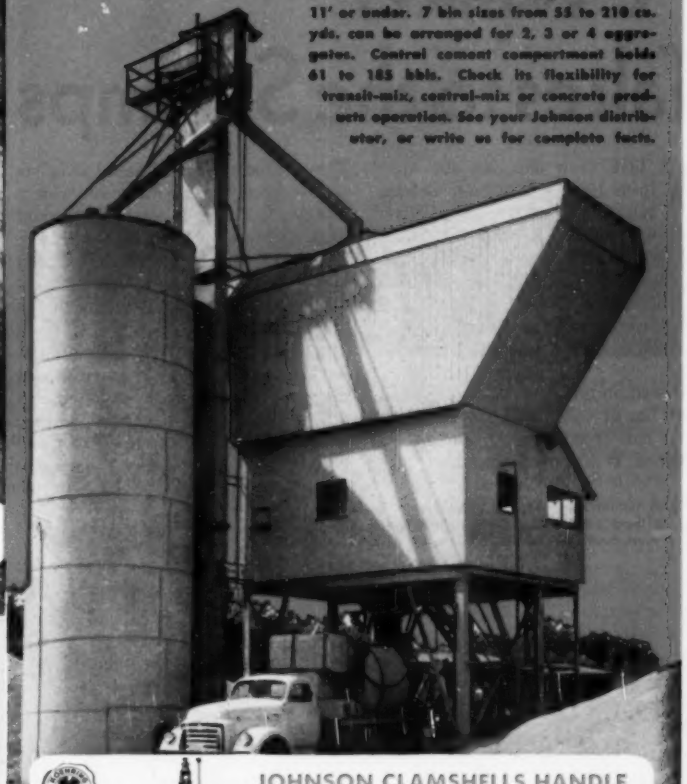
KOEHRING (KOEHRING HEAVY DUTY) **DUMPTOR®**

This mountain-side job shows typical no-turn shuttle advantage. Hauling along narrow ledge, Dumptor spots close to Koehring 1½-yd. 605, gets its load, drives to fill, dumps, returns to shovel — without turning.

all welded . . . PORTABLE

FOR TRANSIT-MIX • CENTRAL-MIX • CONCRETE PRODUCTS

Quickly moved to reduce haul distance of mixed concrete, Johnson Transit-Mix Plant has all-welded, easily-assembled units. Its portable-section Tandem Bin minimizes field bolting . . . dismantling, erecting take less than half the time required for moving a bolted plant. All sections are easy-handling width . . . 11' or under. 7 bin sizes from 55 to 210 cu. yds. can be arranged for 2, 3 or 4 aggregates. Central cement compartment holds 61 to 185 bbls. Check its flexibility for transit-mix, central-mix or concrete products operation. See your Johnson distributor, or write us for complete facts.



JOHNSON CLAMSHELLS HANDLE EXTRA TONNAGE *because:*

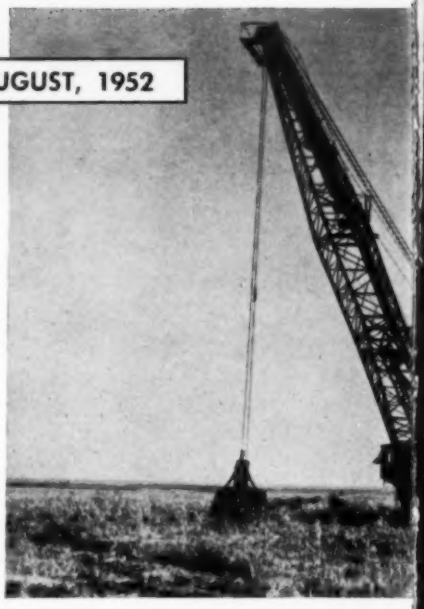
- Large diameter sheaves, with fully sealed needle bearings, reduce friction power loss, deliver full power to cutting lips.
- All-welded construction improves bucket balance, lowers center of gravity, lets teeth dig in straight and deep for capacity load in any material.
- Hard manganese cutting edge, welded to lips, gets tougher with use, assures long life.
- 10 sizes . . . ⅜ to 3 yards . . . General Purpose, Wide Rehandling and Heavy-Duty Digging types. Write for new catalog.

X13

(Koehring Subsidiary) **C. S. JOHNSON CO.** CHAMPAIGN, ILLINOIS

Excavating Engineer · founded 1905 · AUGUST, 1952

A Walker Takes to the Swamps

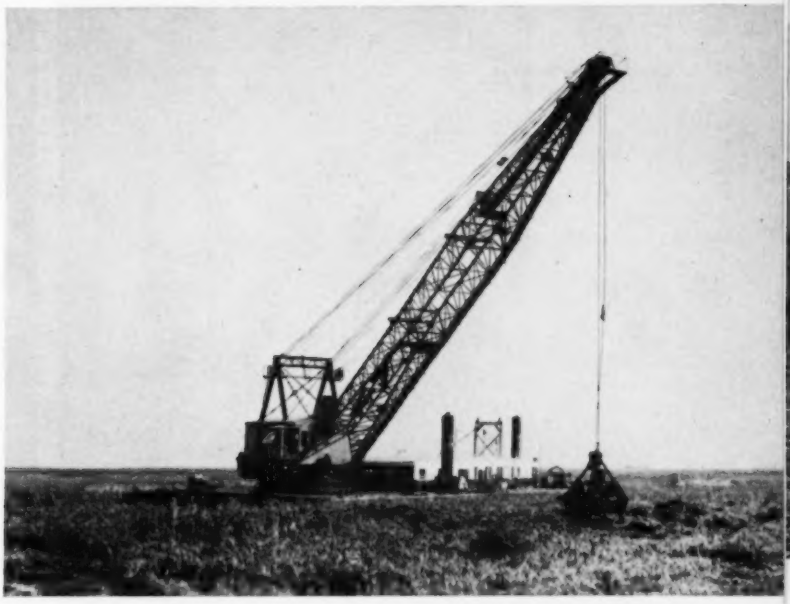


AS THE crow flies, it's 100 miles from Harvey, the New Orleans suburb, to the Mississippi River delta toe. One of J. Ray McDermott & Company's Widgeons—built by the Grumman Aircraft Co.—wings down and back almost daily and has it all over the crow in such matters as speed, payload, comfort, and general convenience.

Indeed, in the McDermott organization's line of work, the amphibious airplane has become more than a convenience. It is a precious business tool. The contracts these oil field specialists take on each year are many and widely separated. They are often high-priced jobs and always call for expensive equipment—barges, dredges, tugs and giant derrick barges. To keep these operations running smoothly and in the black, officials use their fleet of 10 airplanes as another contractor might use his favorite pick-up to move around the job. Most McDermott jobs lie in the tidelands area; hence amphibious planes best serve the purpose.

Excavating Engineer's representative recently took part in one of these flying inspection trips. We were scheduled to go down the delta to see one of the company's projects in action. We met A. H. Stall, vice president of J. Ray McDermott & Co., at the pleasant, modern headquarters in Harvey.

• Canal unfolds behind J. Ray McDermott & Company's barge-mounted walking dragline as it pulls borrow from Louisiana delta marshland. Here machine builds outer toe of 6-mile endless levee which will become two fresh-water reservoirs.



• Upper left: Bucyrus-Erie 200-W walker swinging 6-yd. Blaw Knox clamshell excavates load of silt. Upper right: Operator swings boom about 70°, stops, and gently opens bucket. Soft material must be dumped easily to avoid spreading. Marsh is too soft for walking; picture was taken from Higgins swamp buggy. Barge displaces about 5 feet of water.

From here, we drove to the airport at Callender, where several of the contractor's planes are quartered.

James "Fireball" Finney, our pilot, had wheeled the two-engine Widgeon out on the apron ready for take-off. We loaded on a few packages of sundries for job personnel and were off the runway by 8:00 AM. The plane followed the Mississippi River channel where it flows through the marsh, silt, fresh water and salt water combination called delta.

Passing underneath were oil drilling rigs, pumps, fishing boats, ocean-going vessels headed up channel for New Orleans, and the single road which wends part way to the tip of the delta.

Vice President Stall pointed out various pieces of McDermott equipment at work in the oil fields we passed over. There were tugs, barges, crawler excavators on barges, etc. Typical item:

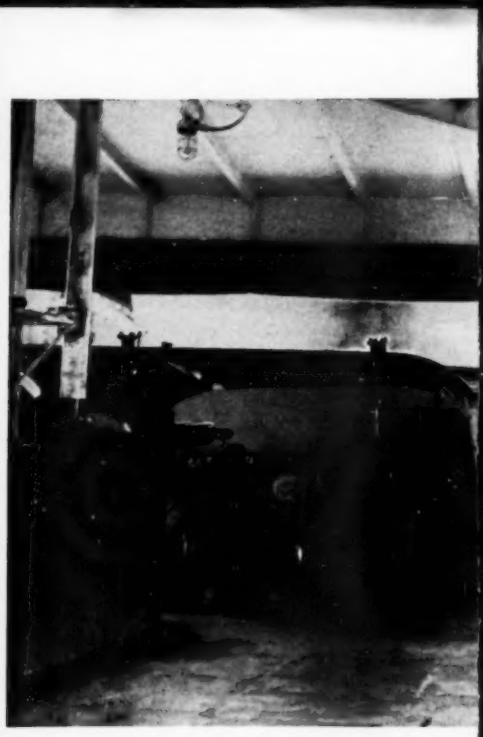
In the rich marshes below New Orleans, Freeport Sulphur Co. will soon mine a vast new sulphur dome. An important part of the $10-15 million plant now under construction is the fresh water supply needed in the mining-by-melting process. A long-time expert at marshland excavating — J. Ray McDermott & Co., Inc., Harvey, La. — is moving 2.8 million yards of muck to build two huge fresh-water reservoirs. Maintaining a brisk earth-moving pace is the contractor's barge-mounted walking dragline.

In recent years the company has introduced a 100-ton-capacity barge-mounted derrick capable of lifting an entire drill derrick via a cable dropped through the center. Relocation time has been reduced by this crane to the extent that many rigs have been able to sink one extra well per year.

Flying along, we were in radio contact with the tug *Daisy McDermott* in the bayous below. We passed over the Richardson and Bass field where McDermott keeps 2 or 3 dredges, a derrick barge and 3 or 4 draglines busy the year round. In addition to moving rigs, the company digs access channels to new drilling sites, keeps channels navigable, moves equipment and fuel barges, lays pipe line and digs slush pits. The $7 million worth of pipe line the company handled last year indicates the magnitude of its contracts.

The lone, branchless, gravel road ends at the cluster of fishermen's

• Standing at bow of *A. H. Stall* are M. E. Drinkwater (left), captain of the dredge, and A. H. Stall, vice president of J. Ray McDermott & Co., Inc.



• Above: A 3-drum American Hoist and Derrick hoist raises and lowers spuds. Hoist is powered by General Motors Diesel, works through Twin Disc clutch and is braked with Westinghouse air brakes.

• Left: Operator's eye view from 200-W cab shows type of material filling bucket.

houses known as the Jump, just below Venice. From there on, it's boat, plane or swim. Some 20 miles below this point lies the job we were to visit.

Where the delta blends into the Gulf of Mexico, the McDermott Co. has undertaken a contract for someone other than its usual oil company customers. For Freeport Sulphur Co.—oldest of the U. S. producing companies—they are building two fresh water reservoirs. One of these pools will furnish water for mining a fabulous new sulphur dome while the other will supply water for Freeport's boilers.

Although the sulphur firm is an out-of-the-ordinary customer for J. Ray McDermott & Co., Freeport's project calls for equipment and methods which are right up the contractor's alley. It is mainly excavating work in the swamps where McDermott crews have thrived for many years.

On a tract of marsh land between the forks of Cadro Pass and Dennis Pass, the contractor's barge-mounted Bucyrus-Erie 200-W walker plies a steady course through the swamp. The muck it excavates is carefully placed to one side where it will form the base for a continuous, enclosed levee six miles in circumference. Another 3,880 feet of levee will cut through this enclosure to make two separate reservoirs.

A channel forms at the stern of the barge-excavator as it moves forward pulling borrow from the swamp. This waterway served as our landing strip. We had circled the installation several times, and our pilot aimed the Widgeon into the narrow channel. Since the excavator had been digging along this stretch only a short time, the channel was still short. We dropped in just over the top of the marsh grass and Finney lowered the plane's landing gear in the water to secure quicker braking.

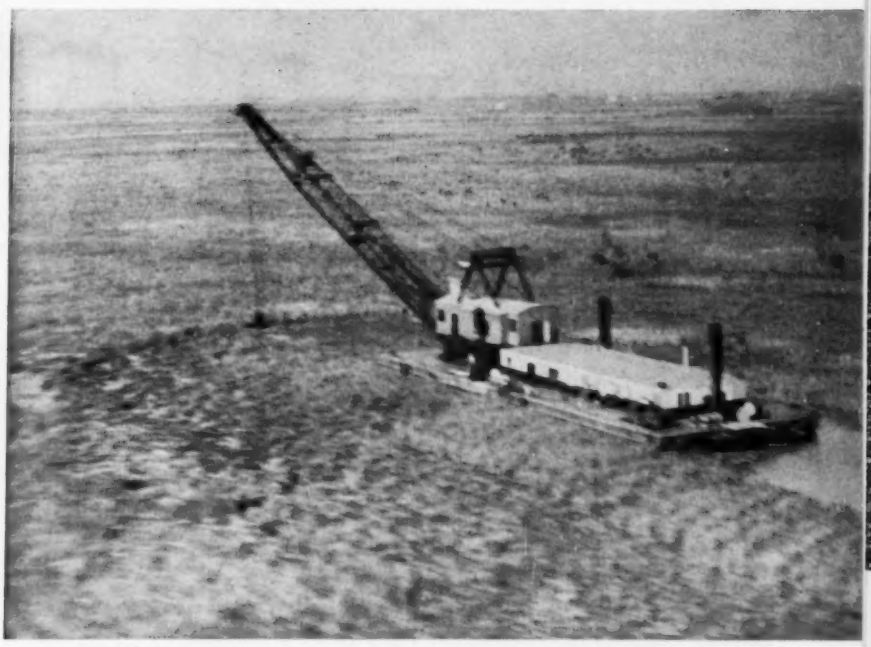
Expert Bush Pilot

Tight quarters are not new to Finney and he halted the plane with room to spare. On occasion, he has landed the Widgeon in channels where the wingspan exceeded the bank-to-bank width. The plane was moored to the stern of the barge which we boarded.

This spud-barge, christened the *A. H. Stall,* is the pride of the McDermott fleet of marine equipment. Final cost of the machine ran almost ½ million dollars. The price does not seem so steep when you get a close look at the completely outfitted barge.

The 150 ft. by 50 ft. by 9 ft. 6 in. hull was fabricated by Avondale Marine Ways in New Orleans. It is of all-welded construction of ⅜-in. steel plate which has been metallized. In addition, five coats of paint stand back of the prediction that the barge will not have to see drydock in 7 years. The barge is an "inside and outside" piece of marine equipment. It may be worked on inland waters, or the compartments can be battened and it may be taken through rough seas to any place in the world. Fully loaded, it displaces 5 feet of water.

In her holds, the *A. H. Stall* carries 10,000 gallons of drinking water, 76,000 gallons of fresh water and 56,000 gallons of Diesel fuel. It was planned to



• Airplane photo shows spud barge *A. H. Stall* at work. Speed boat is moored to stern. Cabin section of barge is air-conditioned, houses sleeping quarters for 18, showers, kitchen and dining room. Barge carries fuel and water supply in hull.

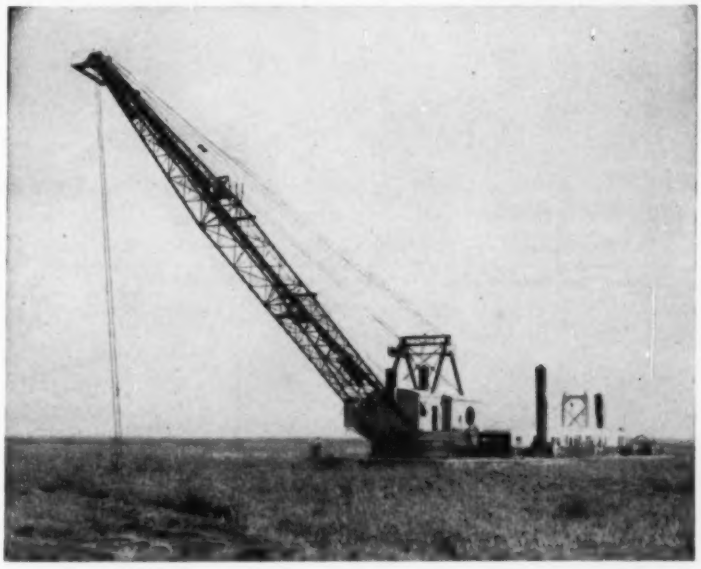
have enough storage capacity to keep the barge out 4 months without putting in for fuel or water. Practice has shown that larger drinking water compartments will be needed to fulfill the plan. A similar barge which the company is now constructing will devote more room to water and will also include other refinements.

The contracting company has also designed a fuel-water barge which will be coming off the ways soon. It will carry 20,000 gallons of Diesel oil and 10,000 gallons of fresh water. Barging supplies to the *A. H. Stall* and refueling on the site will extend the periods that the machine "can keep its nose to the grindstone."

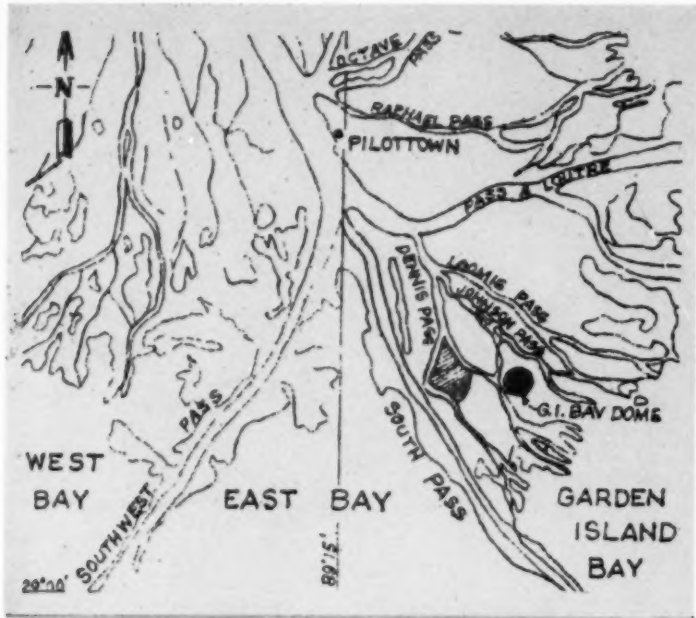
The only fuel used on the barge is the Diesel fuel stored in four 14,000-gallon compartments below decks. It powers the auxiliary speedboat, which makes daily supply runs to the camp. It powers the light plant, the 200-W excavator, the cooking stove, the water heater, and the spud winch engine. All these demands drain an average 10,000 gallons per month from the hold.

On the barge are sleeping quarters for 18 men—one complete crew. There are showers, lavatories, a dining room, kitchen and captain's quarters. The deep freeze is big enough to hold an entire steer. A full-time cook keeps the crews fed. All rooms are air-conditioned to make life more pleasant in the Louisiana heat. All food and incidental supplies are brought in by speedboat.

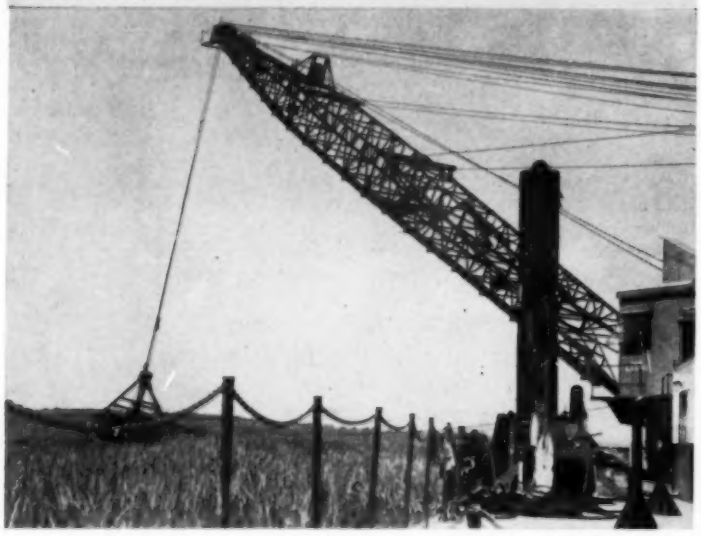
Minor repairs are made in a small but complete machine shop. It includes a lathe, a 200 amp Lincoln arc welder and a grindstone to keep the ever-present machetes honed. The

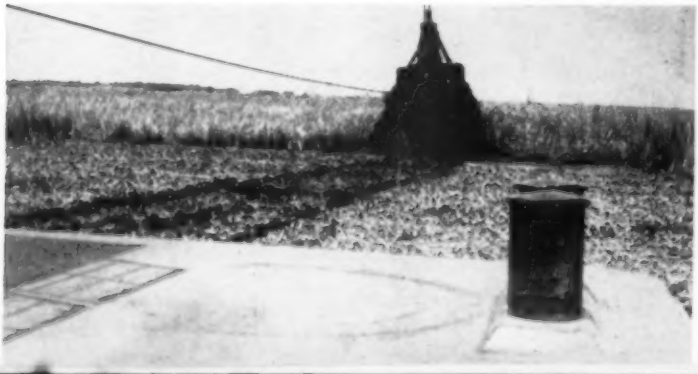


• Bucket is dug into muck with spuds raised. Operator winches in tagline pulling barge forward about 10 feet. Rear spud is hinged and is shown tipping forward with motion of barge. Spud winch operator drops spuds on signal from 200-W operator that forward movement is completed.



• Map of Mississippi river delta tip shows location of Freeport Sulphur Company's Garden Island Bay dome. Shaded portion just to left is reservoirs.





• Above: Operator swings bucket back fast after dropping load of silt. Boom must be momentarily stopped before dumping or silt will not build up to form levee toe. Below: View from bow of barge discloses floating carpet of water lilies.

knives are needed as protection against water moccasins and rattlesnakes which inhabit the area. Nests of alligators are also uncovered from time

The Bucyrus-Erie 200-W walker which has been mounted on the barge is a standard machine as turned out by the manufacturer. The McDermott Co. bought the machine complete, removed the shoes and attached the tub to the deck of the barge. A number of steel chocks set around the perimeter of the base hold it in place. These can be cut away, shoes put on and the machine walked away—if that ever becomes necessary.

The 200-W is powered by a GS-6 Cooper-Bessemer Diesel. An extra blower has been installed in the cab to help dispel engine heat in the warm climate. The machine is under Ward Leonard control.

On the present job, the 200-W is swinging a 6-yd. Blaw Knox clamshell on its 140-ft. boom. The McDermott Co. ordered the machine with a 125-ft. boom which was long enough for oil field work but more length was needed on the present job. A 15-ft. insert was removed and a 30-ft. insert installed in its place to give them a 140-ft. boom. The bucket is a coke and light materials handling type since the swamp muck is exceptionally easy to dig. In sand and harder material, the crew outfits the excavator with a 6-yd. Hendrix dragline bucket which is stored on board. Leschen wire rope is used throughout.

The clamshell tagline—or the drag cable in dragline service—becomes a tow rope in producing forward motion of the barge. When the maximum cut has been made, the operator digs the bucket into the muck straight ahead of the barge. He delivers two blasts on an air whistle. They signal the winchman to hoist the two side spuds. With the spuds up, the operator hauls in on the tagline and the barge moves forward 10 feet. Another double whistle blast tells the winchman to sink the two side spuds. The rear spud is hinged and gradually drops into place.

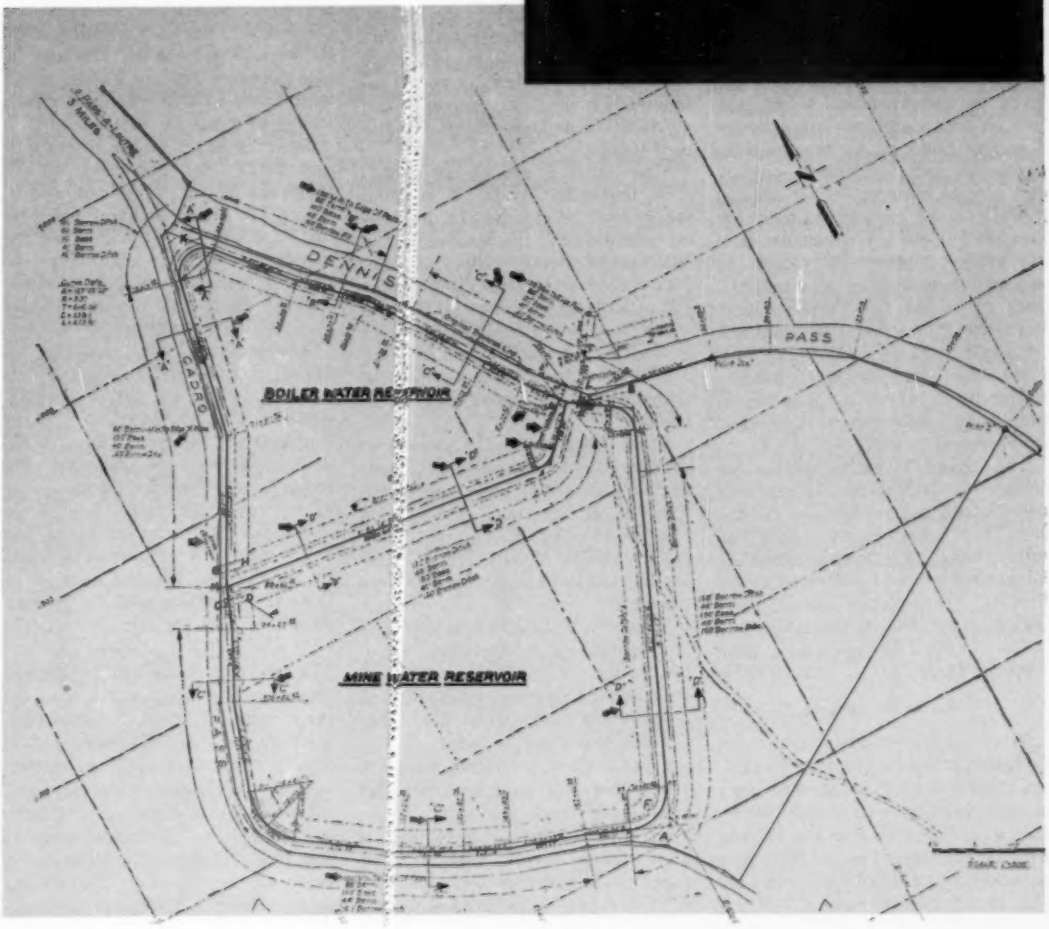
The spuds are welded steel, 30 inches square and 40 feet long. They are hoisted with a two-part line run on a 3-drum American Hoist and Derrick hoist. There is one drum for each spud. A General Motors Diesel furnishes power to the hoist through a Twin

Disc clutch while Westinghouse air brakes keep it in check. Twenty thousand pounds of line pull are available on each drum.

J. Ray McDermott & Co. pioneered the use of spud barges in the Louisiana marshlands country. Excavators working on the soggy footing were formerly supported by wooden mats; many still are. But the spud barge, which might be more correctly called a dredge, has increased the speed of swamp excavation, eliminated many of the difficulties which sometimes included seeing an expensive machine sink out of sight, and given additional space for carrying supplies and equipment. McDermott now owns 15 of these floating platforms, all short wave radio connected with the company's fleet of land, sea and air equipment. The *A. H. Stall* has a two-way RCA short wave set in the captain's cabin.

Three complete crews keep the barge

• Right: Grumman Widgeon, two-engine amphibious plane, used by J. Ray McDermott & Co., Inc. officials noses towards excavated channel where it will land. Barge - mounted excavator will be on this job 8 or 9 months. Below: Here is plan of endless levee and transecting levee which will form two reservoirs.



● Here is up-Mississippi plant of Freeport Sulphur Co. Ground is more stable, will support heavy stockpiles of sulphur. Pipe line for handling molten sulphur serves barge dock.

going. One crew sleeps, one works and the third is at liberty. Two 12-hour shifts are maintained on the barge which operates 24 hours a day, under floodlights at night. Every three days, one crew leaves the barge. It is relieved by the group which has just been off for three days. This arrangement was preferred by the workmen themselves and McDermott officials were pleased to agree.

McDermott's present contract for Freeport Sulphur Co. is included in a $10 to $15 million expenditure the sulphur firm is making to construct a plant to exploit the Garden Island Bay dome. Production at the plant will eventually reach ½ million long tons a year, the largest single sulphur development anywhere in the world in two decades. It is expected to be ready for operation in 1953.

The deposit is native sulphur, or brimstone, which is the cheapest and purest of the various forms of the element. It is better than 99% pure. The sulphur occurs in a typical salt dome formation which was discovered by the Texas Co. in exploring for oil. Freeport obtained the sulphur rights early in 1951 under the terms of a lease from the Texas Co.

Mining by Melting

When sulphur was first discovered in Louisiana in 1867 by prospectors drilling a salt dome for oil, attempts were made to bring it to the surface by ordinary mining methods, but all met with failure. Then Herman Frasch, a noted petroleum chemist, conceived the idea of "mining by melting"—injecting immense quantities of superheated water into the deposit to liquefy the sulphur and pumping it to the surface. Frasch proved his theory with a successful demonstration in 1894, and eight years later it had become an established commercial success. With modifications and refinements, it is still used today.

Since water is one of the miner's most important "tools," a generous supply must be at hand. In tidewater marshland mining, this presents a problem since the plant is located miles from a fresh water source. At Garden Island Bay, the reservoirs McDermott is constructing will store millions of gallons of fresh water drawn from the Mississippi during certain periods of the year when salt content is at a minimum.

Salty or brackish water causes scaling and corrosion with resultant damage to boilers and other equipment. This is an important consideration when you realize that upwards of 2 million gallons of superheated water per day will be required in melting the sulphur.

The first cut the 200-W is making is 70 feet wide and 6.5 feet deep. Forty feet of the cut will become the outward berm of the levee which comes to grade 4 feet below water line. (The 6.5 feet taken out includes piled-up silt, water lilies, and marsh grass.) A similar cut will then be taken out around the inside perimeter of the levee. Two parallel toe levees will be built with the borrow taken out. Between these toes four additional lifts will bring the levee to full 12-ft. height. The finished levee will be 100 feet wide at the base and will have a 10-ft. crown.

When the spud barge makes the second trip around the reservoir—both on the inside and outside of the levee—the cut will be taken from outside the 40-ft. berm. The excavator will also be able to go to a depth of 10 feet. It will mean that the 200-W will have to reach farther to dump the material.

Both toe levees will be 5 feet high after the first lift. The second lift will bring the center section to a 5-ft. height. The fill will be 6 feet high after the third lift, 8 feet high after the fourth lift and 12 feet high after the fifth lift. Specifications call for slopes to be uniform and free from water pockets after each lift.

The spud barge will travel 12 miles to construct the toe levees and 6 miles per each additional lift. When *Excavating Engineer* visited the job, the clamshell was moving 10 to 12 thousand yards in a 24-hour day. The amount varies with the lift and swing of the bucket. In constructing the toe levees, the silty material must be laid down easily or it will spread too much to be of value. The bucket must be brought around, stopped and dumped. In spite of this, the excavator was operating on a 30-second cycle.

A crew man in hip boots walks into the swamp to stake out a path for the dredge. Freeport Sulphur engineers, under the direction of Will French, check the grade of the channel at 100-ft. intervals. At these check points, the grade is confirmed laterally across the width of channel every 10 feet. The McDermott crew also checks the grade from the bow of the barge as it progresses forward. It is essen-

tial to have the minus 4-ft. grade accurate because it will become the levee berm.

Although Vice President Stall considers the present performance of the dredge *A. H. Stall* satisfactory, he points out that it has done considerably better on occasions. The machine was put to work for the first time on Jan. 7, 1951, and it has been going strong ever since. It dug 800 lineal feet of channel 65 feet wide and 11 feet deep for the Superior Oil Co. in one 24-hour period. In that time, 21,184 yards were excavated. The excavator had the advantage of being able to dump to either side. On the Rockefeller Refuge lease, the 200-W moved 1.6 million yards in 4 months. The contractor considers a 400,000-yards-per-month pace about right.

It is expected that 8 or 9 months will be needed to complete the split reservoir. Estimates place the total amount of earthmoving on this job at about 2.8 million yards. Total contract price will depend on the yardage moved.

Captain of the dredge is M. E. Drinkwater, an old hand at swamp excavation. President of J. Ray McDermott Co. is R. Thomas McDermott.

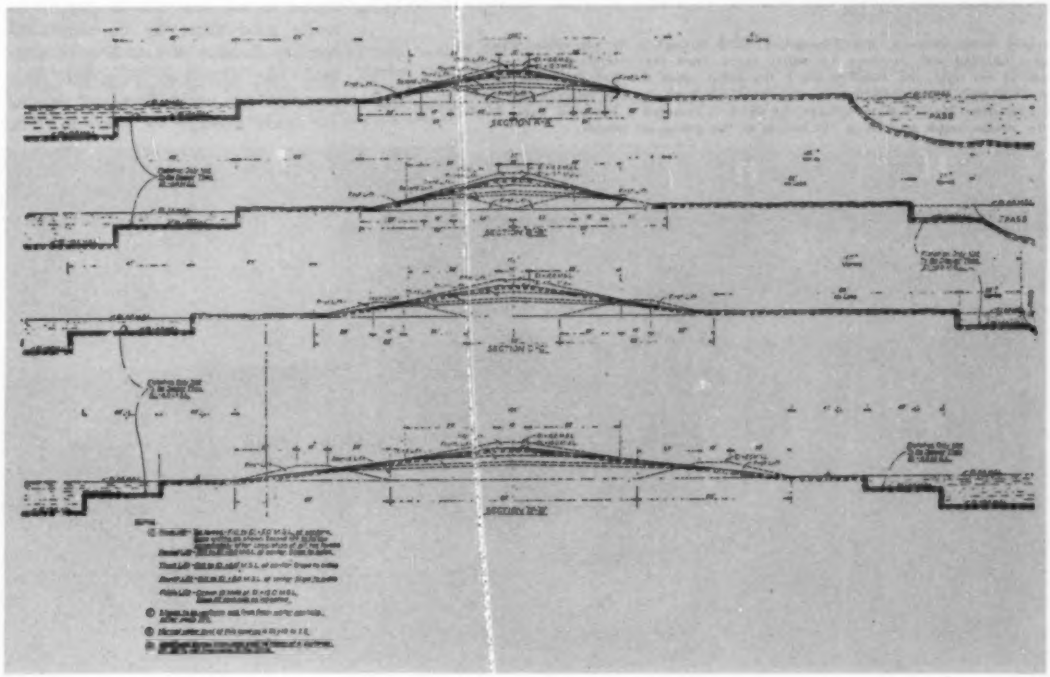
• Sliding down the ways at New Orleans is one of steel tank barges with which Freeport Sulphur Co. will transport molten sulphur from Garden Island Bay plant to Port Sulphur on the Mississippi river. Barges are insulated and are steam heated internally to maintain sulphur temperature.

Four insulated steel tank barges—one already launched—will be used by Freeport Sulphur in transporting the mined product from Garden Island Bay to Port Sulphur, a 45-mile upriver haul. Port Sulphur is the company's main plant. It is situated on more stable land which will support the big stockpiles of sulphur.

Built into each of the 224-ft. barges is a steel cylinder of 1,000-ton capacity. A 4-in. blanket of insulation and coils inside the cylinder through which steam will be piped during loading and unloading operations will keep the molten sulphur at a temperature of 300° F during shipment. The barges cost $150,000 each.

Soon Freeport Sulphur will begin driving the forest of pilings which will be necessary to support its new plant. In the construction, Freeport engineers will apply techniques they developed 20 years ago in building the industry's first marshland mining plant at Grande Ecaille, some 55 miles below New Orleans, after experts warned that the operation "will prove to be an impossible sulphur mining proposition."

• Sections of levees illustrate successive lifts which will build levee to full 12-ft. height.



Graham:
Great Name in Gravel

by Ray Day

ALMOST any day when the weather is halfway fair anyone driving down Rosemead Blvd., Alameda St. or any of southern California's major trafficways is bound to see the two-toned, gray-and-brown delivery vehicles of Graham Bros., commercial producers of concrete aggregates at El Monte. Invariably the trucks will be well loaded, well kept, modern, and freshly painted. The thought almost suggests itself that it must take a dozen pits and a monstrous organization to fill the highways with the loads one sees on an average day.

Nothing could be farther from the truth. Most of the material originates from an average-size pit at El Monte, and one Bucyrus-Erie 120-B shovel, fitted with a 6-yd. Esco dipper, is all that is needed to spew forth some 1,000 tons an hour. The organization is compact, streamlined, and efficient. A casual visitor might judge the 1,000 ton an hour plant to be capable of not more than half that much, but somewhere within that simple miscalculation is the difference which makes the name of Graham Bros. stand out among the gravel producers of southern California.

One of southern California's foremost producers of sand and gravel cuts costs, ups efficiency, and produces 1,000 tons of aggregates per hour.

The road to El Monte has been a long one for Paul and Russell Graham. Back in 1919 the Grahams established themselves in the sand and gravel business, hauling sand from Signal Hill near Long Beach. In 1922 the firm was incorporated, and 1923 was the year when the Grahams persuaded William Wrigley to let them establish their first quarry on Catalina Island, 26 miles offshore from Long Beach. For several years their business did well, and many concrete structures around Long Beach still stand as a monument to their first efforts.

But the hub of concrete construction shifted northward, and the Grahams began to eye the vast deposits of gravel at the junction of the San Gabriel and Rio Hondo Rivers, near the mountains at El Monte. This was the finest deposit in all of southern California. By 1931 the Grahams had secured their first foothold in this area.

During the depression years, a piece of property in the San Fernando Valley was also worked, and many thousands of tons of aggregates and sand were removed. This property was excavated to ground water, abandoned about 1942, and later sold to Los Angeles By-Products Co. for use as a disposal area.

Gradually the El Monte property was developed, a plant established and modernized, excavating equipment purchased, and output boosted. As residential areas began to encroach toward the El Monte aggregate deposit—which is the last known supply of really good aggregate in economical hauling distance of Los Angeles markets—the Grahams extended their property by purchasing and leasing as much acreage as possible. The

● Left: Power comes to this Bucyrus-Erie 120-B through a flexible cable, which is never handled with anything but safety tongs. Note the exceptionally smooth pit floor at the right. The smoother this is the better speed the Eucs can make getting to the shovel. Shovel loading from high bank fills truck in three cycles. Lower right: A Caterpillar No. 12 motor grader, on which is mounted a hydraulic dozer blade also, dresses roads and keeps the bottom of the gravel pit smooth.

• General view of Graham Bros. rock plant at El Monte shows the crushing and screening center of the plant, storage piles, and in the background a gantry-mounted American Revolver 3-yd. clamshell which stacks and loads material.

property now covers about 500 acres, and includes a processing plant for sand and gravel, an office headquarters, and repair shops. In addition to the El Monte plant the Grahams own and operate a production plant at San Juan Capistrano, and have recently reopened a quarry at Catalina Island to produce riprap, crusher-run material for roadbuilding, and miscellaneous rock. But more about this later.

• Here one of the sleek Graham transit concrete trucks delivers load to pour footings for new Pershing Square garage in Los Angeles. Company runs three commercial concrete plants in area. Below right: A loaded Euclid dumps on the run over the 100-ton trap at the El Monte plant. The steel channels over this trap are dozed off once a shift to remove spillage and save hand labor.

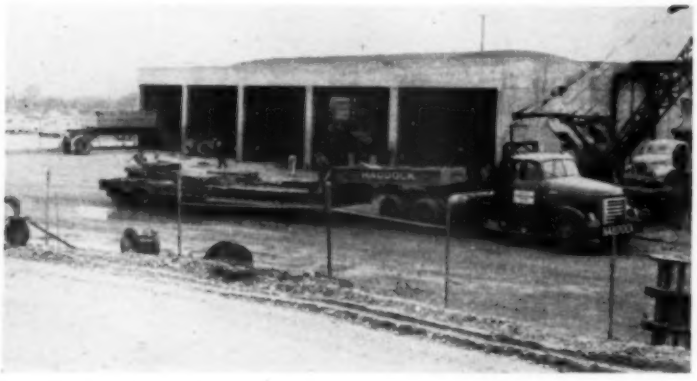
Ideal Deposit

The El Monte pit deposit is ideally situated for the production of aggregates at high speed and low cost.

Starting far up in the Sierra Madre

• This P&H 1055-LC dragline has the job of loading the Catalina Island plant with pit run rock. At the far left is a loaded barge, tied to a buoy, waiting for the second such barge to be loaded. As a rule two barges are towed each trip.

• Above: A Caterpillar D8 with dozer cleans up a haul road at the Catalina quarry. Below: Here is a section of the shop in the main yard, where trucks and other equipment are repaired.



Mountains, both the San Gabriel and Rio Hondo Rivers pitch down at steep hydraulic gradients, often from 15 to 40 fpm. During periods of flash floods in past ages, both rivers spewed untold millions of tons of granite and other igneous boulders out from the base of the mountains. The material fanned out over a wide delta, and although both rivers take an independent course to the sea, the gravel deposit is practically monolithic.

The gravels in this deposit consist of everything from coarse sand to boulders as big as 30 inches in diameter. Exploratory core drilling has been done in this area, which indicates that the deposit is something over 1,500 feet deep. In an ordinary summer season the ground water level stands about 150 feet below the surface of the ground.

These conditions make for many competitive advantages. In heavy construction periods almost anyone can make money out of almost any reasonable kind of gravel deposit, but it is another matter entirely when construction activity wanes. It is in these lean periods when the difference between hauling uphill 50 feet or 150 feet, the ability to change shovel locations to fine or coarse material, the difference between little water or a lot of water, or the difference between no preliminary stripping or plenty of stripping begins to show up. The El Monte pit has every advantage of selectivity, so that coarse sizes or fine can be produced at will for changing market conditions.

Shovel Digs Raw Material

Virtually no clearing or stripping has been necessary over the entire property ahead of the shovel work connected with the excavation and loading of raw material. The El Monte pit represents a clear-cut case of high speed shovel loading.

The excavation plan in the pit follows a pattern of sweeping circular cuts on a radius of perhaps 500 feet. The electrically-powered Bucyrus-Erie 120-B shovel—which does the loading—removes a block of raw material about 37 feet high by 30 feet wide at a pass, leaving the bank in an almost vertical position. A relatively high bank can be excavated by the machine because the pit-run material caves down nicely and there is no danger of undercutting any of the gravel to a point where it might be dangerous. The shovel works the entire length

of a course before moving back to the starting point to begin the next. Power for the 120-B comes in from the Southern California Edison Co.

The shovel dipper is an outsize 6-yd. Esco, heavily hardfaced with Stoody self-hardening rod to resist the terrific abrasion from digging the hard material. H & L teeth are used on the digging lip and an H & L adapter is also used. The operator can hoist the dipper through almost the entire height of bank without any perceptible lugging down of the hoist motor.

Hauling units for points close to the plant consist of three Euclid bottom-dump machines, with one for a standby. The ordinary 13-yd. capacity of these units has been extended by steel sideboards so each unit will take three swings from the 6-yd. dipper on the 120-B. When the Eucs haul from more distant parts of the property, they tow a 20-ton trailer. Ordinarily they each make about 12 round trips an hour. The capacity in tons is figured at 30 for the belly dumps bare, and 50 tons total when trailers are used.

Each truck is numbered, and as each truck arrives at the plant the checker keeps a record of its arrival.

Dump Hopper Saves Time

As the Euclids roll into the entrance to the gravel plant they come to a dump hopper or trap which is something of a time saver in itself. Of 100-ton capacity, it consists of more than a mere truck dump. Its top is at the approximate plant ground line elevation and it is of concrete construction. Two 36-in. channel irons are placed across the top of the hopper and are spaced so the Euclids can roll in, dump while moving, and get away with practically no spill.

Once each shift the Caterpillar No. 12 motor grader which dresses the pit around the 120-B comes out to smooth down the haul roads. When it reaches this hopper, it makes one pass with the hydraulic bulldozer blade mounted on the front of the machine. Any spill is thus pushed in the hopper, and no labor is wasted with a shovel and a broom.

The openings of the hopper are wide enough to receive any rock or gravel the pit can produce. Just below the track a grizzly is suspended, with bars spaced to reject in a waste area below any rocks bigger than about 16 inches in diameter. The high end is suspended from the channel iron by heavy steel cables, and the slope is sufficient to reject oversize material quickly.

• Johnny Abrams, plant superintendent, looks out over various benches of the Graham Bros. pit as a 120-B loads in the background.

Efficient Plant Routing

The routing of material through the plant is modern and efficient, and consists in general of taking material away to storage just as soon as it meets size specifications. Good sand or pea gravel, for example, is never routed through a crusher with oversize material.

When the Euclids dump into the trap, a Jeffrey combination vibrator and grizzly moves the material along. This feeder-grizzly is about 6 feet long, with the lower 3 feet a grizzly section so the fines in the pit run can bypass the crusher and drop through to the off-bearing belt. Oversize rock carried on the grizzly passes to a 24 x 36 Traylor Bull Dog primary crusher.

Throughs from this crusher go immediately to a 48-in. conveyor belt, which has a vertical lift of 83 feet. About half of the lift is out of the deep pit in which the Bull Dog crusher is set up. The belt is a B. F. Goodrich Co. super long life 10-ply conveyor with seven cord plies and three woven plies. It has a 3/8-in. cover with two breaker strips and a 1/4-in. bottom cover with one bottom strip. Its total thickness is about 1½ inches. It is powered by a 150-hp General Electric motor, which like many others in the plant is provided with an ammeter for visual observance of loads handled. This belt is always operated with about 45 inches of its width covered by material, representing a 100% load.

• One of the big secrets of plant efficiency is 48-in. feeder belt which stacks incoming material from the primary jaw. Operator always keeps it loaded exactly this way, to simulate a 100% load. Belt raises the material 83 feet.

• A Bucyrus Monighan walker swings a 5-yd. clam bucket of crushed rock to one of the barges which haul between Catalina Island and San Pedro-Long Beach. There's no problem of water depth because the ocean floor slants off on a 1:1 slope.

A 110% load will automatically cause a horn to sound in alarm.

Material dropping off this conveyor belt stacks up in a large surge pile, from which about 3,000 tons can actually be recovered if necessary. Should anything go wrong with the primary crusher or conveyor, there is enough surge capacity to let the plant continue operating for a sizable period of time. This surge pile is a source of pride to the Grahams.

Material is pulled from the surge pile by a Jeffrey vibrating and reciprocating feeder, which stacks it on another 48-in. conveyor. It then goes to a 5 x 14 Hewitt-Robins Gyrex shaker screen, consisting of two decks. Material retained on the top deck feeds a 4-ft. Symons crusher. Material retained on the bottom deck passes to a 3-ft. Symons. The crusher product goes up to the top of the plant to start a classification process, while throughs from the screens pass over a 36-in. conveyor to the washing. At this point the material separates.

FIRST HALF: WASHING. Material passing through the washing process goes from the washing box to a 5 x 14 Gyrex 2-deck shaker screen, which lets sand drop through the bottom deck to the main sand hopper. Some of the sand is bled off to a 4 x 10 Simpliflow shaker screen, which lets throughs go to an 8-in. Wemco sand pump and washer. From there this material goes to stockpiles, where it is especially useful as plaster sand in building construction.

• Superintendent Clyde Fouts looks over his Catalina Island camp, nestled in a picturesque cove on the east shore of the island.

Material not bled off goes to a 5 x 10 Gyrex shaker in tandem. Retained material passes to the top of the plant by elevator, while the sand which passes through is flumed to a divider box, where the feed is split between two Wemco washers. These two washers clean the material of anything decantable or dirty, and dump to a 30-in. cross conveyor which takes the sand to stockpiles. A gantry-mounted American Revolver 3-yd. clam places the sand on a drying pile and eventually loads it to stock.

SECOND HALF: DRY CLASSIFICATION. On the "dry" or crushed rock side, material goes over a 30-in. conveyor to a 6 x 16 Vibrex shaker, and material retained passes to three crushers: a 3-ft. Symons, a 4-ft. Telsmith gyratory, and a 5½-ft. shorthead Symons. The through product from these crushers is in a closed circuit back to the shaker screen. All throughs pass by another elevator to the top of the plant and are split into two shakers for final classification to the storage bins. One of these shakers is a Stephens-Adamson 3-deck 4 x 8 in tandem, while the other is a 3-deck 4 x 8 Simplicity, also in tandem.

As a general rule, aggregates are

produced in the following sizes in addition to sand and "buckshot"—a coarse product midway between sand and pea gravel:

No. 4 Gravel . . No. 4 mesh to 3/8-inch
No. 3 Gravel . . . . . 3/8 to 1-3/16-inch
No. 2 Gravel . . . . 1-3/16 to 1½-inch
No. 1 Gravel . . . . . 1½ to 3-inch

In addition, the Grahams at times have produced cobbles from 4 to 12 inches in size for large mass concrete pours.

The aggregates are trucked from the final surge bins and dumped for stacking by either the American Revolver or a Colby 3-yd. gantry-mounted crane. The Colby has a 100-ft. boom and the American a 135-ft. reach. Stub 80-ft. tracks off from the 400-ft. main gantry track permit the machines to move out once in a while for special stockpiling.

The El Monte plant has several other features of interest. For example, excavation has now reached a point 100 feet below ground level, and one or two more passes is all which can be made before ground water becomes severe. Officials are so "water conscious" that exit ramps are always handy so equipment can be moved out of the pit. In the future, large draglines may be used to reach 250 feet deep to recover the valuable material.

Another feature of interest is the fact that even the clay washed out of the sand is not wasted. It is pooled in a stilling basin, and eventually recovered for use in a company hot plant which produces asphaltic concrete. Haul roads are polished smooth every day by the motor grader, and in summer a 10-wheel truck and 5,000-gallon water tank sprinkles haul roads to keep down the dust. Laboratory test equipment is operated by a field engineer and helper to sample the material.

The San Gabriel and Rio Hondo products of Graham Bros. are known far and wide for their excellence, and concrete designers specify aggregates from this deposit when they want to make certain of a strong, durable concrete mix. The rock is especially hard and sound and meets the Los Angeles rattler test better than any rock in the southern California area. As a matter of fact, about 25% of Graham Bros. output is sold to direct competitors to make excellent grades of concrete required for the various jobs.

Enormous Truck Operation

To haul the 8,000 tons away which the plant will produce each day 5 days a week requires a well-organized trucking system. Reos, Internationals, and International Diesels are used, with half of the repair shop set aside for the service of these machines.

• One of the features of the Catalina camp is this immaculate little restaurant run by Mr. and Mrs. D. M. Fouts (left). Superintendent Clyde Fouts is sitting at the counter.

Take Batching Contracts

In recent years, the Grahams have found it profitable to take materials contracts and subcontracts calling for the proportioning of concrete aggregates on field jobs. At the present time the company is teaming up with Consolidated Rock Products Co. at El Toro, where the joint-venture firms of A. Teichert & Son and Bressi-Bevanda Corp. are enlarging the taxiways, runways, and parking aprons at the big naval air station.

The aggregates are hauled in, dumped, and transferred to the plant by a new Bucyrus-Erie 38-B clam, swinging a 1½-yd. Owens bucket. Graham Bros. on this airbase will batch about half the aggregates for a 50,000-yd. concrete job, and about half the material for a 30,000-ton asphaltic concrete hot mix assignment.

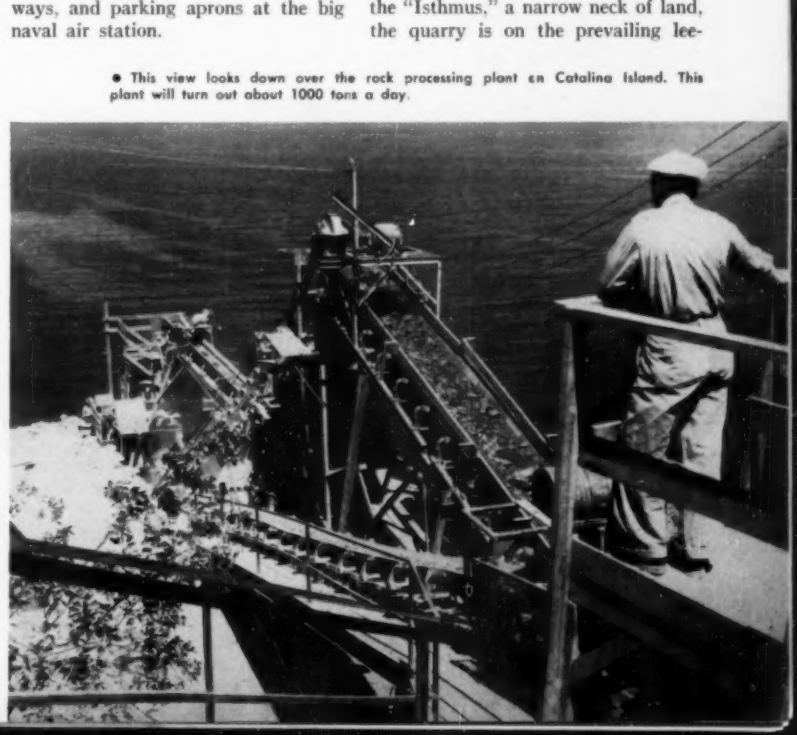
Catalina Operations

Of all the company's operations, the most unusual and scenic layout is on Catalina Island, 26 miles off the southern California mainland out in the blue Pacific. Graham's people commute to the mainland on weekends by United Airlines planes and during the week they operate a rock plant in a setting so scenic and different that it is a world apart from the El Monte plant. And yet, by aid of two-way radio communication, the Catalina plant is in instant communication with headquarters.

The purpose of the Catalina layout is to furnish crusher run base, fine rock, cobbles, and occasionally riprap stone to the market on the mainland in the Long Beach and San Pedro areas. No concrete aggregates are produced at the Catalina plant.

The quarry for production of base course rock is located on the east side of the island near the north end, about 30 minutes drive from the city of Avalon. Situated as it is just below the "Isthmus," a narrow neck of land, the quarry is on the prevailing lee-

• This view looks down over the rock processing plant on Catalina Island. This plant will turn out about 1000 tons a day.



ward side of Catalina and is not exposed to hard storms from the west. A hard northeast storm, however, usually stops barge loading operations.

The quarry is being extended into the side of a hill between 500 and 600 feet high. The rock is composed of many types and hues, from reddish igneous rock to sedimentary sandstone and lime rock. The last powder work was done more than a year ago, when a long coyote hole with lateral drifts was loaded with powder about 130 feet above sea level. The resulting explosion and slides afterward have brought down all the rock the crushing and sizing machinery can handle.

A Model 1055LC P & H dragline, equipped with an 80-ft. boom and a 3½-yd. Esco dragline bucket, loads raw material to the plant. The access road from the beach up to the present quarry floor is about 300 feet long, and on a 37% grade. It looked like an interesting problem might develop getting the new machine up the steep road, but the journey was made without mishap when an Allis-Chalmers HD-14 hooked on ahead and a D8-mounted dozer pushed from behind. With this help, the machine made the climb without undue strain on its new Caterpillar D19000 Diesel and other parts.

The P & H dragline feeds the stone to a raw-feed hopper, where a 4 x 10 ft. shop-made reciprocating feeder puts the rock on a 48-in. belt. This 14-ply cord conveyor is 110 feet long. It carries the raw material to a 40-ton hopper, topped by heavy grizzly rails set at a 10-in. opening and so arranged that large stones cannot wedge. Oversize material from this grizzly rolls down a long slope and becomes a part of the riprap stockpile. Stones in this pile generally range from 150 to 1,000 lbs. in size.

Throughs from the grizzly pass into the 40-ton hopper, which by means of a 36-in. reciprocating feeder and another 48-in. belt transfers the material to the shaker decks of a tandem 4 x 8 Simplicity screen. Material meeting size requirements is immediately dropped through a screen to a discharge conveyor to stockpile. Oversize material at this point is separated by screens and routed to a 4-ft. Symons crusher or a 14 x 38 Alloy Steel Co. jaw crusher.

When *Excavating Engineer's* representative visited the Catalina operation, the crew was making 3-in. minus base material for use in a rock dike and breakwater. Material from 3 to 5 inches was being screened off and sent to the Symons crusher. Some 4-in. material was being crushed to 1½ inches by the rolls.

With the exception of a few conveyor lifts to the screens and crushers, the Catalina plant is a gravity affair, and sized finished material drops about 100 feet down the side of the hill to a big surge pile which can hold up to 12,000 tons. A Model 6W Bucyrus Monighan walking machine rigged as a clamshell then loads material from this surge pile to a fleet of three barges, which carry it to the mainland. The Monighan uses a 5-yd. Owens clamshell bucket on its 130-ft. boom. Set on a level road near sea level, the big machine can reach the barges nicely. One barge will carry 1,200 tons, while the other two will carry approximately 900 tons. The Monighan usually loads a barge in about 2½ to 3 hours.

During the spring months when there is constant danger of heavy seas, a tug stands by while the barges are being loaded. The water is plenty deep; the ocean floor slopes off at an even 45° angle. Thus 500 feet from shore the water is 500 feet deep.

The Catalina operation generates its own electric power by aid of four General Motors 170-hp Diesels driving a 500-kw Westinghouse generator. Electric motors are used through the rock plant. There is 100 hp on the 4-ft. Symons crusher; 40 on the rolls; 30 on the jaws; 20 on the first feeder and the first 48-in. conveyor, and smaller sizes on the smaller conveyors.

The Grahams maintain a clean, comfortable camp near the quarry for the 25 to 30 employees who make up the crew. Small prefabbed houses are located in an attractive setting, and there is even a small restaurant, grocery store, and recreation hall. A small part of the crew lives in Avalon and commutes daily over the graded dirt road which twists down the privately owned island.

Unloading facilities at the Long Beach waterfront consist of a 3W Monighan and trucks. As a rule the finished material is sent directly to the job where it is to be used.

At Catalina as well as on the southern California mainland, Graham Bros. have become a permanent fixture and an asset to the construction potential of the region. Unless something completely unforeseen happens, the various plants owned by the company will turn out material at an ever increasing pace to keep up with one of the most rapidly expanding markets for rock products in the nation.

Company supervision is under the general direction of President Paul C. Graham, with Russell C. Graham as vice president and general manager. Charlton Dunn, Jr. is production manager, J. S. Abrams is superintendent of the El Monte plant; L. I. Johnstone is vice president in charge of sales and engineering, and Clyde Fouts, assistant production manager, is in charge of the Catalina Island operation.

• Graham's newest machine is this Bucyrus-Erie 38-B, rigged as a clamshell. Graham Bros. use it to charge a Johnson batch plant they own and operate. It's set up in this picture at the El Toro Marine base near Santa Ana, Calif., and aggregates batched by the 38-B and the plant are going into some runway extensions at this base.

Trenching Blade Speeds Highway Widening

Digging of trenches along old pavements is made easier with special bulldozer blade. Nello L. Teer Co. designed this device.

HIGH on the list of tough jobs for highway contractors is the digging of trenches along old pavements where concrete widening strips are to be placed. One of the latest wrinkles which promises to iron out this problem, is the trenching blade devised by the Nello L. Teer Co. of Durham, N. C.

This device consists simply of a specially reinforced bulldozer apron, to which has been added a drop center section. The drop center horizontal cutting edge is made by welding a short section of an old blade to the bottom of the blade to be used. This is reinforced by welding gusset plates on the back of the blade and drop center cutting edge. The dimensions of the drop center section are determined by depth and width of the trench desired.

Vertical cutting edges are welded on the ends of the drop center section to cut the material away from the pavement and to produce a vertical cut on the outer edge of the trench. A vertical fin is welded to the angledozer blade to assist in forcing the excavated material to the roadway shoulder in order to keep the roadway as clean as possible.

A metal shoe is welded to the blade and allowed to slide on the existing pavement. It serves as a grade template and a minimum amount of damage is done to the pavement. Street pads are placed on the right tracks of the tractor as a precautionary measure against damage to the pavement. The blade is angled to the left causing the operator to face oncoming traffic.

Before actually cutting the trench, a motor grader takes a pass along the shoulder in order that the tractor tracks may travel on approximately the same elevation. This method assures a more uniform trench.

This combination brings into play the digging force needed to rip up heavily compacted gravel, bituminous armorcoating, and other encrusted material that often occupies shoulders.

• Welded on street side of blade is a metal shoe which slides on existing pavement. Drop center cutting edge and back of blade are reinforced by welding gusset plates behind cutting surfaces.

• Heaping load is quickly piled up on first pass. Note compacted earth broken and rolled out on roadway shoulder.

• On cleanup pass, blade leaves smooth trench with vertical sides. Street pads are placed on right tracks of tractor to protect pavement.

The new 315-mile crude line from Houma, La., to Port Arthur, Tex., was rated one of the toughest of this year's crop of pipe line jobs. Houston Contracting Corp., Houston, Tex., had the contract for the Texas Pipe Line Co. They became . . .

Seagoing Pipeliners

• Spud barge with Northwest dragline aboard digs underwater trench for Texas Pipe Line Company's new 315-mile crude pipe line from Port Arthur, Tex. to Louisiana gulf. Muck is cast to side where wave action will produce natural backfill.

ONE of the country's toughest 1952 pipe line projects was completed this summer in the Louisiana-Texas Gulf Coast area. An experienced pipe line contractor, Houston Contracting Corp., Houston, Tex., wound up in July the 315-mile crude transmission line it began last March for the Texas Pipe Line Co., subsidiary of the Texas Co. The new line includes a gathering system serving off-shore wells in the Terrebonne Bay vicinity, a line from the bay to Houma, La., and a line from Houma to the Texas Company's refineries at Port Arthur, Tex.

Although not as long as several of the cross-country tubes under contract this year, the Texas Co. crude oil pipe line was still a big job and a mighty difficult one. Most of its 315-mile length passes through marsh, open water in the Gulf of Mexico, and swamp growth as thick as a South American jungle. Native wildlife—namely water moccasins and rattlesnakes—were among the hazards confronting crews. To cut trench, the contractors brought both marine and land equipment into play. Welding skill and inspection were of prime importance because a single flaw would be exceedingly costly to repair once the pipe was submerged.

Texas Pipe Line Company's new crude line—reputed to cost in the neighborhood of $18 million—replaces a costly triple-play method of handling the crude. Oil was barged from tidelands lease tanks to a storage point in the middle of Terrebonne Bay. The storage facility, called Port Texaco, consists of three ocean-going tankers attached in bow-to-stern fashion. Their hulls rest on the bottom of the shallow bay, making a more-or-less permanent base. Their holds provided ample storage capacity for well production in the vicinity. Periodically, crude was barged from the storage point to tankers anchored in deeper water. These tankers, in turn, transported the oil to the company's Port Arthur refinery.

Beside this laborious operation, the 22-in. line will replace an existing 8 and 10-in. line from Houma westward. The smaller line will be converted to a products pipe line system.

Line Includes 6 Sizes

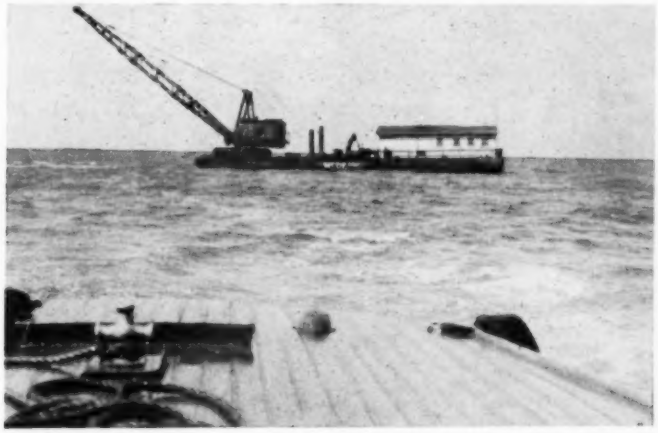
A wide variety of pipe sizes goes to make up the system which Houston Contracting Corp. installed. From the refinery to Houma, 220 miles of 22-in. pipe were put down. Another 38 miles of 12-in. pipe were laid from Houma to Cocodrie (crocodile), La., which is the gateway to the lease. In the bay, 57 miles of 4, 6, 8, 10, and 12-in. fingers leading to wells were laid to make up the gathering system. A 6-in. line was installed to Lake Pelto; an 8-in. line to Bay Sainte Elaine; 8 and 10-in. pipe to Caillou Island; a 4-in. line to Lake Barre.

When this was written, work was winding up on the 22-in. pipe line. Three spreads had about completed the line from Morgan City, La., to Port Arthur. Some road crossings and miscellaneous operations were being completed. One of the spreads was laying the last link of the 33-mile 22-in. tube from Morgan City to Houma. The spread was equipped as follows: Buckeye ditchers, Caterpillar Diesel powered, to cut a tapered trench (as insurance against caving) wherever ground was solid enough to work the machine; Bucyrus-Erie 22-B and Lorain clamshells and draglines to cut road crossings and dig ditch in the swamps; Caterpillar D8's with Trackson sidebooms for lowering-in; Caterpillar D8's with booms and backfiller blades to place cover (the draglines and clams handled

a good share of this work, too); International TD-24's and Caterpillar D8's with Bucyrus-Erie and Caterpillar blades respectively for right-of-way clearing; Lincoln arc welders mounted on Ford pick-ups for the welding; and a Caterpillar D8 with hydraulic blade which took an angle cut along the stake line preceding the ditchers.

Ground cover on the line was about 3 feet deep over the pipe crown. In salt water marsh, not the open bay, the mainline pipe often got a 2 to 4-in. coat of concrete. It was blown onto the pipe to provide extra weight.

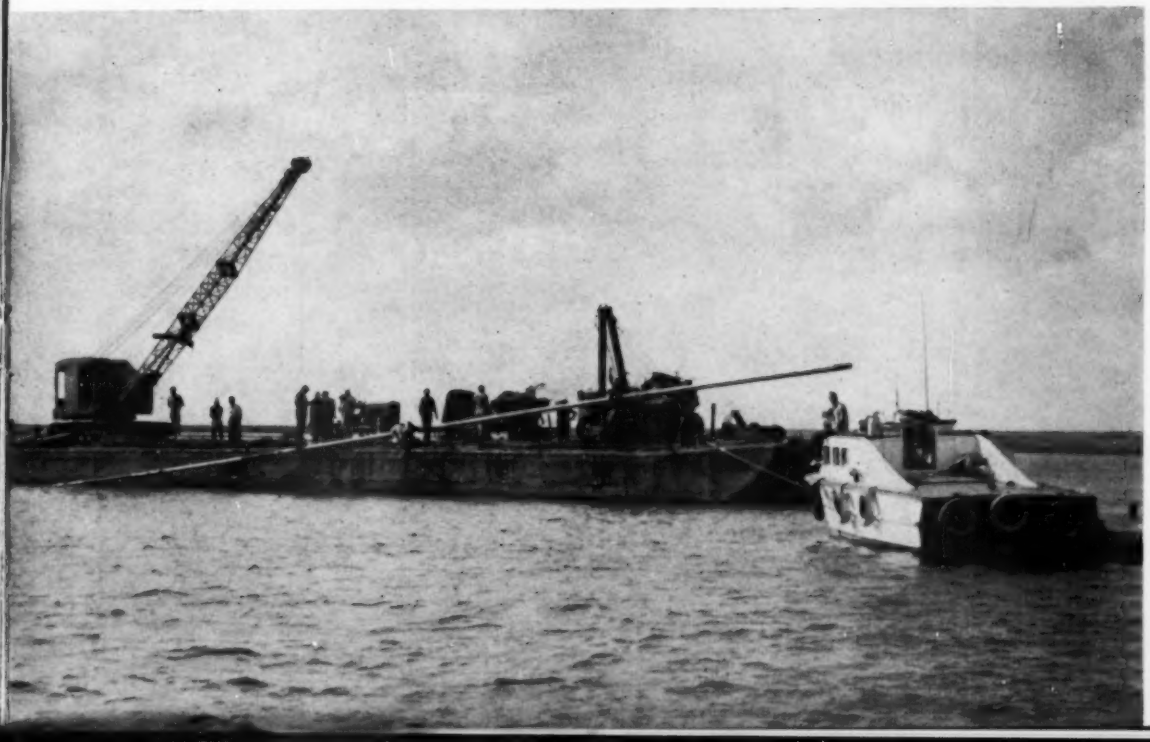
The spread which was putting down

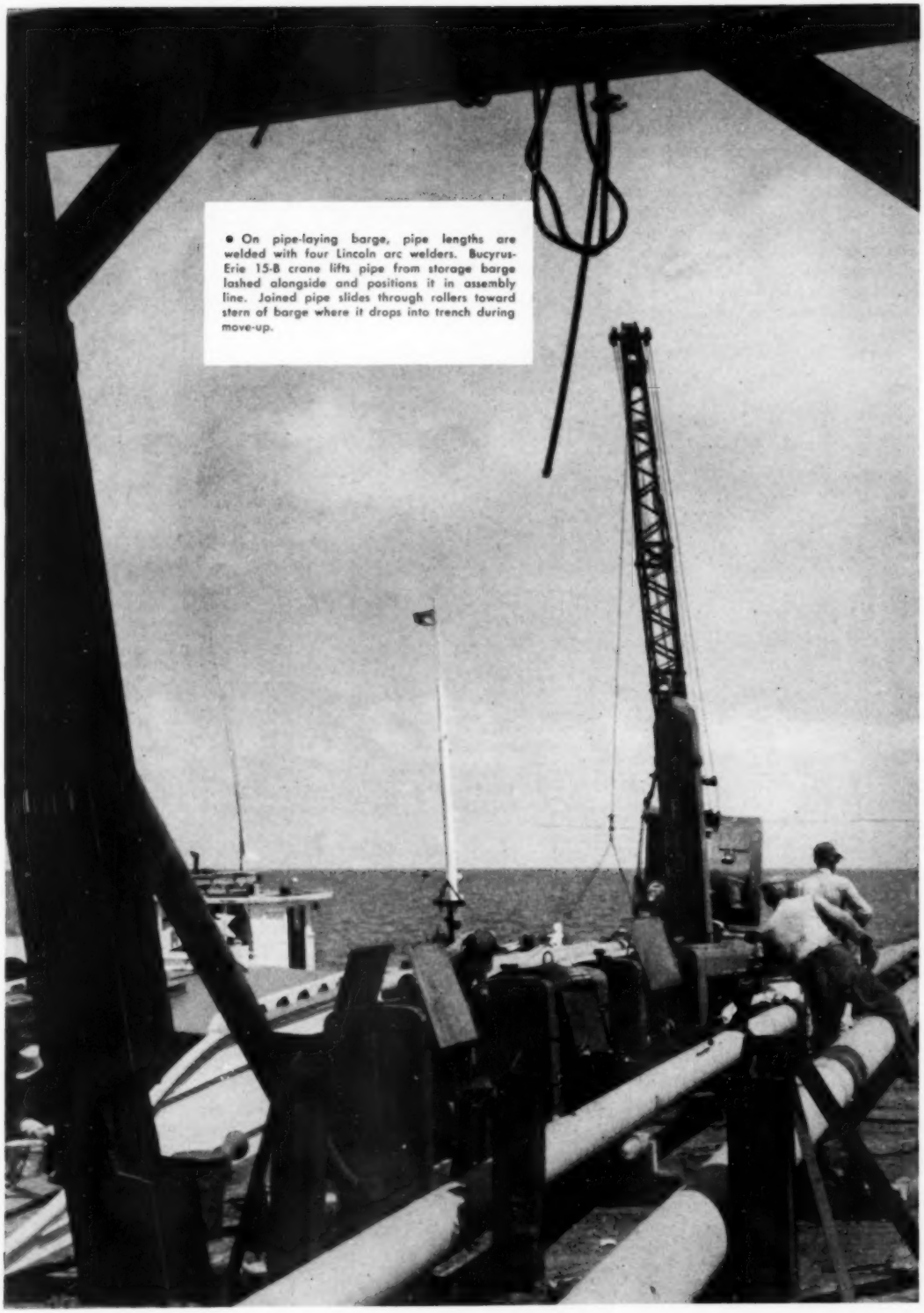


• Top left: Fifteen minutes of trawling between barge stops nets haul of shrimp, crabs, shells, etc. Top right: Surveyor's flag-topped stakes set trench path for spud barge on horizon.

• Left: J. Ray McDermott & Co., Inc., Harvey, La., owns spud barge and excavator shown putting down pipe line trench. They have sub-contract for big share of excavation in Terrebonne Bay where gathering system is being laid.

• Bottom: Barge-mounted Bucyrus-Erie 22-B crane and Caterpillar D7 crawler with side boom hold 6-in. gathering line prior to lowering-in. Welders equipped with Lincoln arc welders weld on length at a time. Equipment belongs to Houston Contracting Corp., Houston, Tex., holders of the pipe line contract.





• On pipe-laying barge, pipe lengths are welded with four Lincoln arc welders. Bucyrus-Erie 15-B crane lifts pipe from storage barge lashed alongside and positions it in assembly line. Joined pipe slides through rollers toward stern of barge where it drops into trench during move-up.

the last of the 22-in. pipe had the longest stretch of work assigned to it. This group of men and machines under superintendent F. A. Silar laid 86 miles of the large pipe from Gueydan, La., to Houma. Field headquarters were maintained at Abbeville, La. Another spread headed by superintendent W. H. Hayes installed 67 miles of the main line from Gueydan west to Holmwood, La. It set up field headquarters at Jennings, La. A third spread handled another 67 miles of 22-in. pipe from Holmwood to the refinery at Port Arthur. Superintendent E. C. Norris maintained headquarters at Lake Charles, La.

Lay Water Pipe

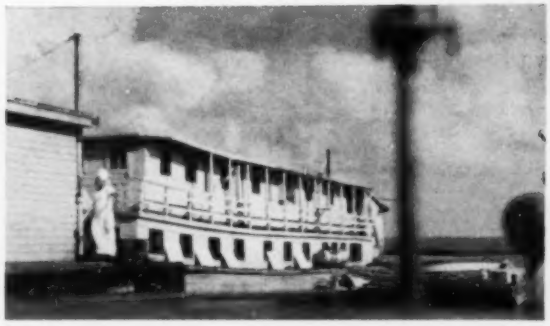
The smaller diameter pipe running south from Houma to Cocodrie and branching out into Terrebonne Bay was being laid under the direction of the field office in Houma. Here, H. L. Leake was the superintendent, S. B. Harrison, the assistant superintendent and H. C. MacWhinnie, the office manager. Although all of the line passes through unusual terrain, the work at the east end was by far the most interesting. It was still in progress at the time *Excavating Engineer* visited the job.

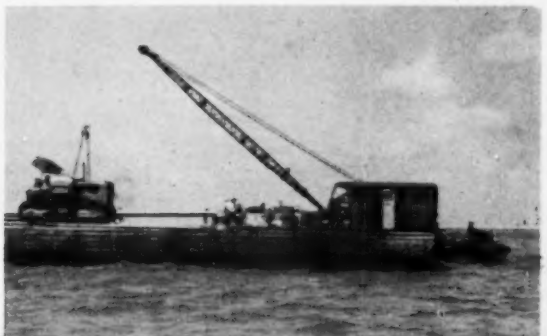
To lay the 4, 6, 8, 10, and 12-in. gathering system in Terrebonne Bay, the contractors had to put the spread on barges. Underwater excavation was sub-contracted to J. Ray McDermott

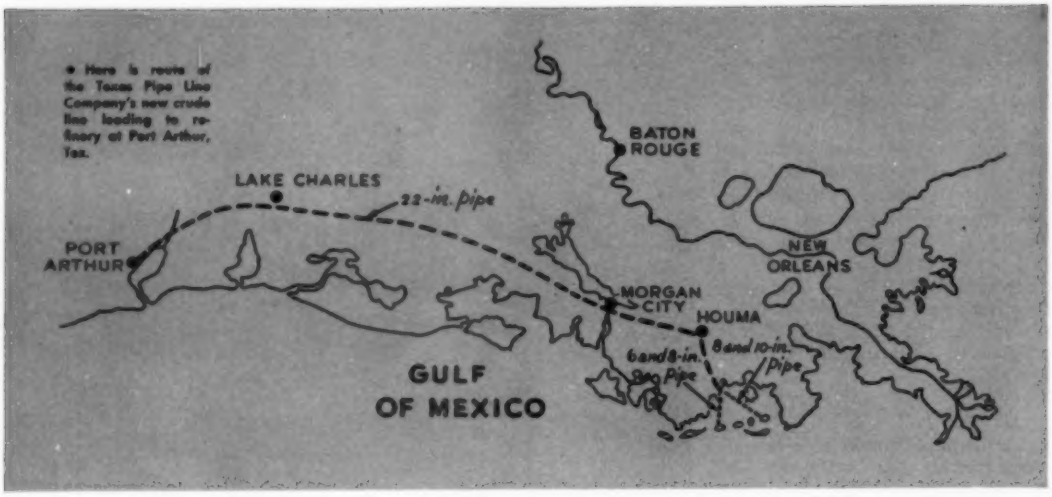
• Above: Welders work on 10-in. pipe. Two lines — 8 and 10-in. — were being laid in single trench. Two D7 Caterpillar tractors with side booms shuttle pipe towards stern of barge as new lengths are welded on. Entire new section of pipe is then welded to free end of completed line; the barge moves forward and the pipe sinks into its underwater trench.

• Below left: One of Texas Company's drill rigs stands in Gulf of Mexico marsh while Houston Contracting Corporation's spread lays 6-in. gathering line. Bottom left: Inspectors for Texas Co. hold mid-bay conference from two speed boats. Leon Anderson, seated with notebook in pocket, is project engineer for Texas Co. Man in front of light with back to camera is W. K. Woodward, chief inspector. Job inspectors occupy other boat.

• Below right: Quarters boat provides housing for spread personnel who stay on bay till job is finished. Cook rounds corner of chow barge. Bottom right: From small barge, Bucyrus-Erie 15-B passes pipe to bigger barge where D7 crawler positions it for welders. Lugger or tug moves barges when pipe is ready for lowering-in.






• Here is route of the Texas Pipe Line Company's new crude line loading to refinery at Port Arthur, Tex.
BATON ROUGE
LAKE CHARLES
22-in. pipe
PORT ARTHUR
NEW ORLEANS
MORGAN CITY
HOUMA
8 and 8-in. Pipe
8 and 10-in. Pipe
GULF OF MEXICO

• Left: Caterpillar-powered Buckeye ditcher puts down slightly tapered trench as insurance against caving. Very little of the total line was as easy to build as this 22-in. section near Morgan City, La.

• Below: Caterpillar crawler with side boom and backfiller blade covers 22-in. pipe line.

& Co., Inc., Harvey, La. Their two-spud barge followed the surveyor's line of poles stuck in the water. A Northwest dragline with Hendrix bucket mucked out the trench at the stern of the barge as it moved along. Dirt was cast to one side where wave action would cause a natural backfill shortly after the pipe was lowered in. Twenty-foot guide stakes were set up at 100-ft. intervals and about 20 feet wide of the trench path. Thus the side of the barge could be moved along the guide line and the trench dug without disturbing the stakes. And the pipe-laying barge which followed could make use of the same stakes.

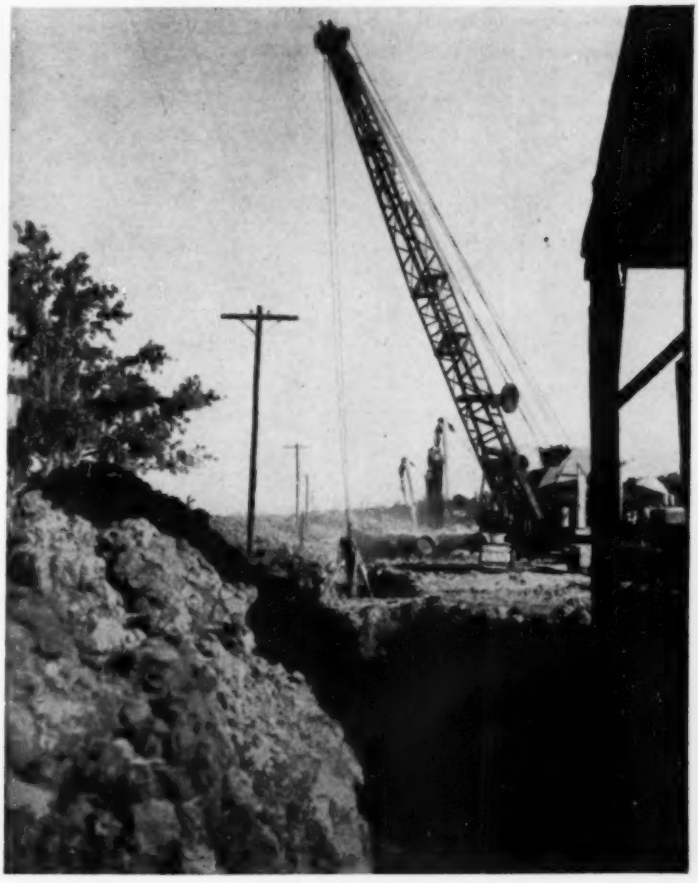
Handle Pipe on Barge

A half-mile behind the excavator, Houston Contracting Corporation's pipe-laying barge was putting down small-diameter water pipe. Actually there were two barges lashed together and a tug as pusher. The smaller barge held the supply of pipe. A Bucyrus-Erie 15-B crane on the pipe barge lifted the lengths from stockpile and fed them into the assembly line operation on the larger barge. Here, the pipe was welded, joints were coated and wrapped and the pipe laid in the trench. Two D7 Caterpillar tractors with Trackson side-booms kept the pipe moving as lengths were welded on.

Two parallel lines were being laid in the trench at once. Farther along, the lines—one 8-in. and one 10-in.—would branch out to various wells. The stern of the barge sloped toward the water and the free end of the submerged pipe line was held on board here. At the bow

• Above: Cat tractor with angle dozer takes preliminary cut along stake line on right-of-way. Ditcher follows.

• Right: One of Houston Contracting Corporation's Bucyrus-Erie 22-B clamshells cleans out around road crossing. Water rises in trench as soon as it is dug.



of the barge, lengths of pipe were welded together and passed backward by the sidebooms until the entire section reached the free end of the pipe line. Welders made a final weld here and the new section—about 100 feet long—was ready to be lowered-in.

A Stroudsburg winch powered by Waukesha engine hoisted the four spuds located near each corner of the barge. Crewmen signaled the lugger, or tug, captain. The barge was pushed forward and the completed section of twin pipe line dropped off the barge's stern into the trench. Barge movement was slow and cautious so there would be no chance of missing the underwater trench.

Demand Top Welders

When forward movement again brought the pipe end to the stern, the spuds were dropped and the welding, coating, and wrapping sequence began once more. To facilitate the lowering-in operation, the pipe moved along the length of the barge on stationary roll-

ers. On board the barge were Lincoln arc welders, supplies of wrapping paper, and dope kettles. Welders on the barge had to be the best in the business because a poor weld here could become a major calamity.

The distance from water surface to ditch bottom was between 12 and 14 feet. Although specifications required only a 3-ft. ditch, the excavators were cutting it 4-ft. deep. The pipe installed in the bay was a special water type. It was slightly heavier than the land type. Each time the barge moved, inspectors using poles double-checked both the ditch depth and the depth of the pipe as it rested in the trench.

Every 2,500 feet, the pipeliners attached magnesium anodes to the underwater pipe. These are sacrificed to corrosion. The salt water prefers the anodes to the pipe and attacks them. Aside from using the anodes and the water-type pipe, no extraordinary measures were needed to protect the gathering system.

More Barges in Bay

On another barge, a D8 Caterpillar and a Bucyrus-Erie 22-B crane were laying 6-in. line to a well. The tractor and crane were handling the pipe along the side of the barge with new lengths being welded on in much the same manner as the larger operation just described. A lugger provided the pushing power. All crawler cranes operating from barges carried both clamshell and dragline buckets to help dig ditch when the need arose.

A barge-mounted P & H 255-A worked on tie-in manifold installation on another part of the water-covered job.

Barracks on Barge

Additional barges plied the waters, helping to handle the pipe line job. Houston Contracting Corporation's fuel barge touched all equipment barges regularly, keeping them supplied. Barge-mounted barracks—quarters boats—kitchens and dining rooms took care of the needs of crewmen who for the most part stayed out in the bay until the job was finished. A fleet of speedboats provided quick transportation into Cocodrie for supervisory personnel and men doing the town.

Pipe for the job was manufactured by Youngstown Sheet and Tube Co., Youngstown, O. Large diameter pipe was brought to the railhead at Houma by train. From the storage yard it was strung along the right-of-way. Smaller diameters were barged all the way from Pittsburgh, Pa., and stored in yards at various places along the bayous. The well-known J. O. (Red) Willett's Co. was handling a part of the stringing operation. They were using Ford and Chevrolet tractors with pipe trailers and a Quick-Way crane on an International truck to load the pipe.

Coating and wrapping was done by sub-contractor Clem A. Mayes Co., Lake Charles, La., in 10 field yards established along the route of the line between Port Arthur and Houma. Only weld joints were coated and wrapped on the right-of-way.

Officers of Houston Contracting Corp. are Laurence H. Favrot, president, R. P. Gregory, vice president, and George A. Peterkin, vice president.

President of Texas Pipe Line Co. is R. B. McLaughlin; Leon Anderson was project engineer for the oil company; and W. K. Woodward was their chief inspector.

• Left: P & H 255A crane works on tie-in manifold. Barge-mounted crawler is powered by P & H Diesel.

• Below: Here are Texas Co. lease tanks and living quarters for workers stationed on lease.

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MACWHYTE COMPANY, 2903 Fourteenth Avenue, Kenosha, Wis. Manufacturers of Internally Lubricated PREformed Wire Rope, Braided Wire Rope Slings, Aircraft Cables and Assemblies, Monel Metal, Stainless Steel Wire Rope and Wire Rope Assemblies. Mill depots: New York • Pittsburgh • Chicago • St. Paul • Fort Worth • Portland • Seattle • San Francisco • Los Angeles • Distributors throughout U.S.A.

"Dirt-movin'est tractor I ever saw!"

BIG RED CHAMPS! The TD-24s with 148 drawbar horsepower do more work per day—they have more horsepower and speed than any other crawler on the market. And they have Planet Power Steering, for pivot-turns, feathered-turns or turns with power on both tracks!

Big Red TD-24s distinguish themselves building levees to control Missouri River

Near St. Charles on the Missouri River, the levees failed against the flood of '51. But Paul Crawley rebuilt them so they stood firm against the worst the river could do in 1952.

Crawley's contract called for moving 940,000 cubic yards of dirt. A big job, a tough job, in the bitter dead of winter. And for Crawley's money, the International TD-24s proved to be real Champs.

"They're the dirt-movin'est tractors I ever saw," he reports. "There's no other crawler to compare with 'em for daily work production!

"They climbed the levee with full loads with no special ramps of any sort. They'd dump their loads, turn around on the 8-foot crown and go back down for another load. It was work that called for superior power and steering, and my TD-24s had it!"

Get the low-down on TD-24 performance from your International Industrial Distributor. You'll be a TD-24 man yourself from then on in!

INTERNATIONAL HARVESTER COMPANY
CHICAGO 1, ILLINOIS

GOVERNMENT INSPECTOR, George Lemp, talks it over with prime contractor Paul Crawley (right).

CRAWLEY'S CRAWLERS did the job in a sea of winter mud that froze from time to time.

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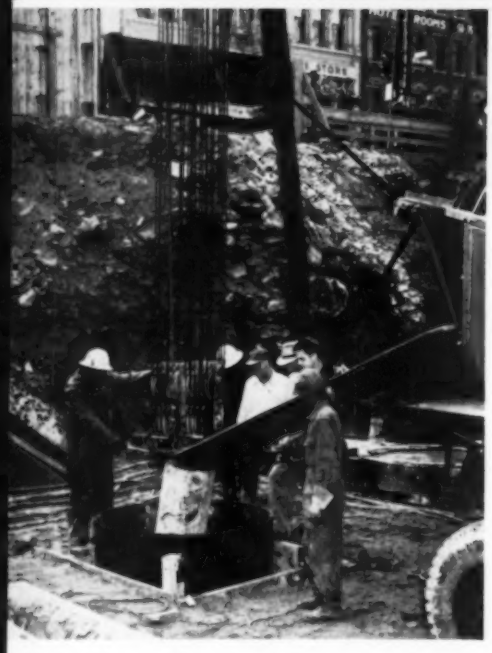
POWER THAT PAYS



• As level of concrete being poured rises, powerful derrick mounted over caisson shaft, starts withdrawing cylinders. Derrick has four air hoists and 28-part pulling line.

• Nest of 16 ft. Gow cylinders is extracted from caisson excavation. Lugs on lower ends of cylinders engage next larger diameter cylinder above, so that set of telescoped cylinders is lifted out as concrete rises to top of largest cylinder.

Bell-Bottomed Caissons Anchor Detroit Structure

THE new City-County building which is under construction at the northeast corner of Woodward and Jefferson Avenues in Detroit is the second unit of the civic center. The first unit, the Veterans Memorial Building, was completed in 1949. The Civic Auditorium, to the south of the City-County Building, and a Convention Hall and Exhibit Building, west of the Veterans Memorial, are the next structures contemplated.

The site of the City-County Building extends from Woodward Ave. east 664 feet to Randolph St., and north from Jefferson Ave. 200 feet to Larned St., providing an area of about three acres for the building and its landscaping. Bates St., between Larned and Jefferson is eliminated, although its concrete sewer, an inverted syphon, 13½ feet in diameter, runs through the site and could not be disturbed.

Functionally, the building was required to house offices for both city and county agencies and to contain the county courts. As a result of this, the plan evolved actually comprised two structures, one for office space and one for the courts, connected by a "link" over the Bates Ave. sewer. The office unit is 262 feet by 111 feet with an area of 29,000 sq. ft., the Courts Building is 155 feet by 76 feet, 11,800 sq. ft. in area. The link connecting the buildings is 38 by 40 feet. The office unit and link are 14 stories high. The courts unit at the Woodward Ave. end of the site is 20 stories high.

Average live plus dead loads on the upper floors due to the large number of heavy filing cabinets and IBM machines used in many of the offices, amount to 150 psf.

The basement areas beyond the building lines proper are of reinforced concrete construction. The columns supporting the "link" between the two units is carried on story high steel trusses concealed in the basement walls which span the Bates St. sewer.

With the floor loads involved and the heights of the buildings the foundation loads are by no means small. Bearing this in mind, and the necessity for adequate foundations at a minimum cost, the choosing of the proper type of foundations required complete information as to the subsoil conditions under the proposed buildings. This information was procured for Harley, Ellington & Day, Inc., the architects and engineers, by the city of Detroit, through the city engineer's office, under the direction of George Thompson.

Get Soil Data

Eleven borings were located on a plot plan by the architects and engineers at pre-determined locations so that they would have representative soil data to cover the site and be able to draw typical cross sections of the underlying soil strata.

Soil samples of both bottle for visual inspection and liner samples for laboratory analysis were secured at 5 foot intervals and at each change of strata from the ground surface (elev. 119 feet) to hardpan. Hardpan samples were taken at 1 ft., 5 ft., and 10 ft. levels of the hardpan penetrated. In two borings at opposite corners of the site, the rock was cored for a depth of 5 ft. and the rock cores retrieved for inspection.

The borings indicated that the soil was composed of a hard crust of yellow clay approximately 10 ft. thick, underlain by a strata of plastic to soft blue clay approximately 100 ft. thick over a hardpan strata of approximately 13 ft. in depth, all of which rests upon the bedrock. The hardpan in this vicinity consists of a very hard compacted mixture of sand, clay, and gravel and is sometimes described as "claypan." The rock for the most part is a broken block structure of fair grade limestone, light gray in color.

A constant source of worry in drilling through the hardpan and rock is that hydrogen sulphide bearing water under hydro-static head may be liberated, which in some areas has measured well above street level, giving

rise to artesian flow. In the borings that penetrated the hardpan, no hydrogen-sulphide water was encountered. However, these borings were sealed off with grout in the rock and hardpan and at specific intervals in the clay to insure that the boring holes were permanently sealed off.

Laboratory tests were carried out in compliance with standard and suggested methods contained in the Manual of Soil Testing, ASTM. The chief tests consisted of Michigan ring shear test, and the unconfirmed compression test along with the particle size distribution, soil constants, water content and dry weight in pounds per cubic foot.

As a result of the soil conditions found by the soil boring analysis certain problems of design and construction came up.

1. To what depth could the excavation over the building area be carried and held during foundation construction without settlement of adjoining streets and buildings?

2. If this depth was less than that to the bottom of the sub-basement, what scheme of excavation by increments would be practical?

3. What would be the uplift pressure on the basement or sub-basement slab due to its depth?

4. What would be the pressures on retaining walls and slab for a ramp and truck unloading area at the basement level adjacent to Larned St.?

5. What type of foundation would be most economical? Could the entire structure be carried on a mat, or would piling or caissons be necessary?

From a study of column loads and their distribution throughout the building, it was apparent that due to the location of the Bates Ave. sewer a certain number of caissons would be necessary. A comparative cost study of the remaining foundations convinced the designers that the use of caissons throughout would be most economical. This raised the further question as to the depth to which they should be carried, whether to the top of the hardpan, a certain distance into the hardpan, or through the hardpan into bed rock.

answers to some of these questions, advice was sought of Prof. W. S. Housel of the University of Michigan well known for his work in soil mechanics.

Determine Excavation Depth

In Professor Housel's report it was determined that an excavation of 21 feet deep was the maximum that could be allowed without exceeding an overload ratio of 2.5. To excavate for the full depth of 32 ft. for the proposed sub-basement gave an overload ratio of 4.0 which would be prohibitive. To construct the sub-basement sectional excavation below the 21 foot level and stockpiling of earth within the excavation would be necessary in order to keep the soil pressures within allowable limits. It also was determined that the uplift pressure on the floor of the sub-basement would be as high as 2,840 lbs. per sq. ft. This would make the sub-basement construction very slow, hazardous, and costly.

With the answers Professor Housel gave, the final design scheme began to shape up. The sub-basement was eliminated and the space thus lost regained by extending the basement areas of the buildings outside of the lines of the superstructures.

Foundations for the building proper were to rest upon 126 caissons to be excavated to hardpan, about 115 feet below street level. The caissons extend from 90 to 92 ft. below basement grade, which is 20 ft. below street grade. Holes for the caissons are sunk by a special rotary drill, with an expansion auger.

The caissons are cast-in-place inside a set of nestable steel casings of 2 in. diminishing diameter for each 16 ft. section. Top diameters of the caissons vary from 58 to 84 in. They are belled out at the bottom on a 1:2 slope, with a 12 in. thick pad at the bottom of the bell.

An 84 in. (top-diameter) caisson was drilled, belled out, and concreted in 24 hours. This is how it is done.

Working at basement level in the area previously excavated by the general contractor, the caisson contractors excavate a square hole, 6 inches larger than the top diameter of the caisson and from 6 to 8 ft. deep, at the site of a caisson to be drilled. Later, these starting pits will be filled with concrete to form caisson caps with intersecting beams on top of the caissons.

Caissons are drilled with a 1¼ cu. yd. bottom-dump auger, mounted on the bottom of a telescoping spline shaft that has a 120 ft. maximum extension Four "Kelley" bars welded lengthwise of the shaft reinforce it.

The drilling rig is mounted at the front of an all-electric crane, and the spline shaft and auger are powered by a 75 hp electric motor.

The auger has a nominal cutting diameter of 48 in., equal to the diameter of the smallest section of caisson on the job. For drilling holes larger than 48 in., two reaming knives at the top of the auger are adjusted to the proper length.

During clockwise rotation these knives turn out and cut to the required diameter, dropping the material into the top of the auger. At the same time

Continued on page 43

• Excavation for new City-County Building which is an addition to Detroit's riverfront Civic Center. Plans call for two structures connected by a link. One unit will be 20 stories high while other will rise to 14.

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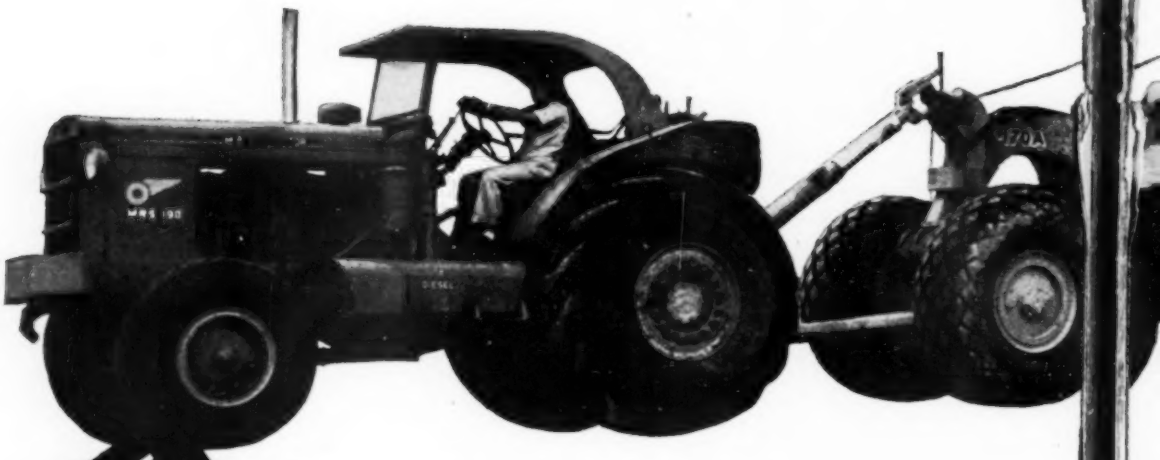

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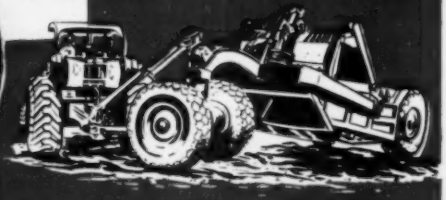
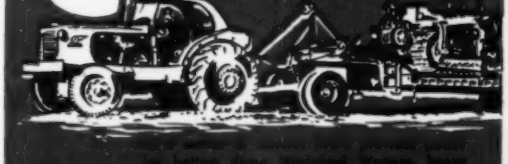
Exclusive WEIGHT TRANSFER provides variable driving axle weight which increases the traction area of the soft low pressure drive tires approximately 40%, producing superior traction.

2 TURNING RADIUS OF ONLY 28'-34'



The short turning radius and high maneuverability of M-R-S tractors when used to pump four-wheel scrapers or bottom dump Mid-West Wagons makes it ideal in construction of narrow secondary roads.

3 GREATER VERSATILITY

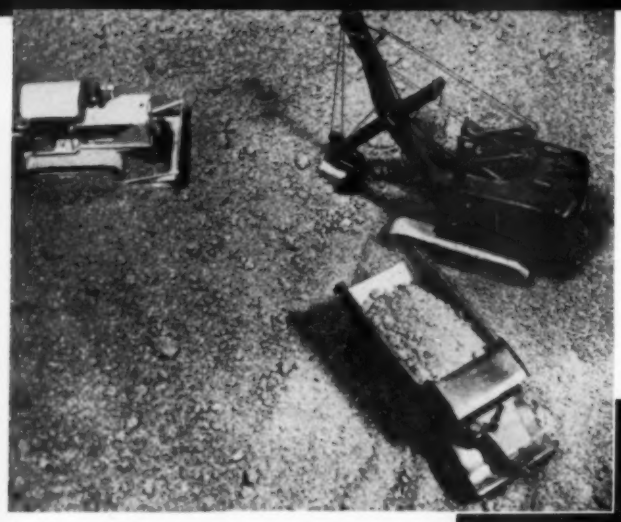


Mid-West Wagons are extremely versatile units for bottom dump operation, heavy compacting rollers, machinery trailers, or for general utility.

Don't you think it would pay to INVESTIGATE *before you* INVEST?

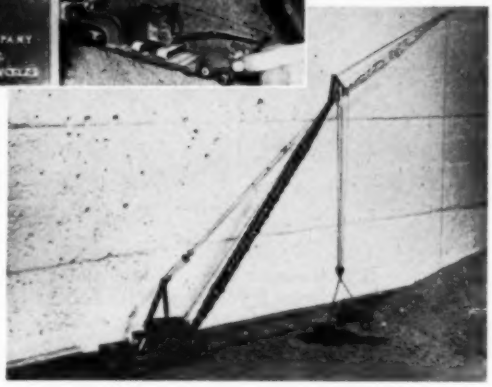
A Model Construction Company

by Robert Lee Behme



• Above left: A realistic scene is formed as shovel loads into Euclid rock-bodied truck.

Left: Eugene Trumble, 16 year old high school student, is perhaps the youngest owner of a complete yard of construction equipment.



• Right: 180 ft. crane lifts truck as easily as if it were in actual use. Models are so constructed as to operate in same manner as full sized machines and to handle same proportionate load. Even cables become snagged and fouled as with full size equipment.

AT 16 years of age, Eugene Trumble is probably the youngest president of an engineering company in the construction business. His company, Future Engineering Co., is also one of the best equipped. He has over 50 pieces of construction machinery in his yard—all of them maintained in perfect working condition. However, this firm has some trouble making a profit since all equipment is constructed in miniature by its president.

Gene became interested in the construction field at the age of 5 years. He and his parents visited a construction project while on vacation. He was so impressed with the machinery and its operations that his prime ambition was to enter the field. His interest in construction has turned more and more toward designing and building the equipment used.

In preparation for his future, Gene began building scale models of present-day equipment as a hobby. On his first machine, a Lima crane, he worked from memory of one he had seen on a visit to a project. However, it bore little resemblance to its original counterpart and he was very dissatisfied with it.

He later found that by using the technical information and photographs contained in the sales booklets put out by equipment companies he could make accurate scale models. On particularly complicated pieces of equipment such as a Bucyrus-Erie walking dragline which is to be his next project, he works directly from blueprints that are supplied to him by manufacturers.

Hand-Carved Machines

He begins construction on a model by making a scale drawing of it, using a scale of 3½ mm. to a foot, or 1/87th of actual size. His machines are hand-carved from balsa wood, and are glued together. He makes pulleys and drum winches in his machine shop classes at Santa Monica Technical High School where he takes all machine shop courses available that pertain to construction work.

It takes him about 8 hours to design and build a small model such as the D8 Caterpillar. More complicated work, such as boom construction on a crane, will take over 2 weeks.

His equipment includes scale models of a 180 ft. Bucyrus-Erie crane, a 180 ft. Lima crane, several Bucyrus-Erie shovels, a Northwest 80D shovel, Euclid trucks, Gardner-Denver compressors, and LeTourneau earthmovers.

Gene speaks of his equipment in terms of full size rather than as miniature models. He knows the uses and load limits of each piece of equipment he has built. His models are so constructed as to operate in the same manner as a full size machine and to bear the same load in the 1/87th proportion. In operation the machines are subject to the same hazards as the full size equipment. The cables and equipment can become snagged and fouled, and need constant maintenance just as their larger prototypes.

Gene hopes to enter into construction work after graduation from high school. He wants to work in the field on projects for five or six years to gain actual experience on the machines. He then hopes to go into advanced instruction.

You can truly say that Gene is a young man who is actually building his own future.

Caissons

Continued from page 39

the auger continues boring at the bottom of the hole.

Following completion of the top 16 feet of hole, the first 16 ft. section of steel casing is lowered into position. Cutting knives on the auger are retracted 1 in. when a second 16 foot depth of hole is bored, and encased with the second section of casing which is 2 in. smaller in diameter than the top section.

This procedure is followed until the hole is bored to its proper depth and cased with six sections of the nestable casing. Two sets of casings are provided for each size of caisson.

The belled-out portion at the bottom of each caisson is excavated by workmen with air-spades. The material is hoisted out of the hole by an electric hoist housed in a 4 x 15 ft. steel frame "dog-house" spotted over the hole.

The concrete is delivered to the job in ready-mix trucks and chuted into the cased holes.

Pulling the Casings

Casings are lowered into the holes with a crawler crane, but they are removed from the hole with a special pulling rig. This rig is positioned over the hole by a crawler crane. It has four legs—one pair is trussed steel pipe; the other pair being braced steel beams which mount the hoisting equipment. The complete rig has a maximum pull of 100 tons.

The six nestable sections of casing are pulled out of the concrete-filled hole by the lifting rig, and seated on a platform of 12 x 12 in. timbers laid across the starting pit at the top of the caisson. The lifting rig is then removed by crawler crane and placed over another caisson being concreted.

Contractors

O. W. Burke Co., Detroit, is the general contractor, and the Raymond Concrete Pile Co., holds a subcontract for sinking and concreting the 126 caissons.

Burke's general superintendent is Fred Fletemeyer. Raymond's top men on the job include: Harry Runkel, geenral superintendent; Construction Superintendents Charles Bates, George Boggiano and Charles Reed; Howard Wipf and Jack Gatlin, assistant superintendents; and Karl Smythe, job engineer.

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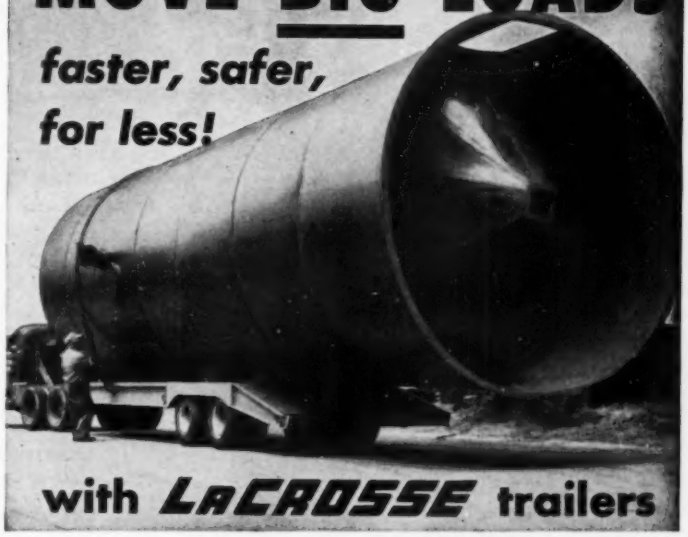

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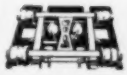

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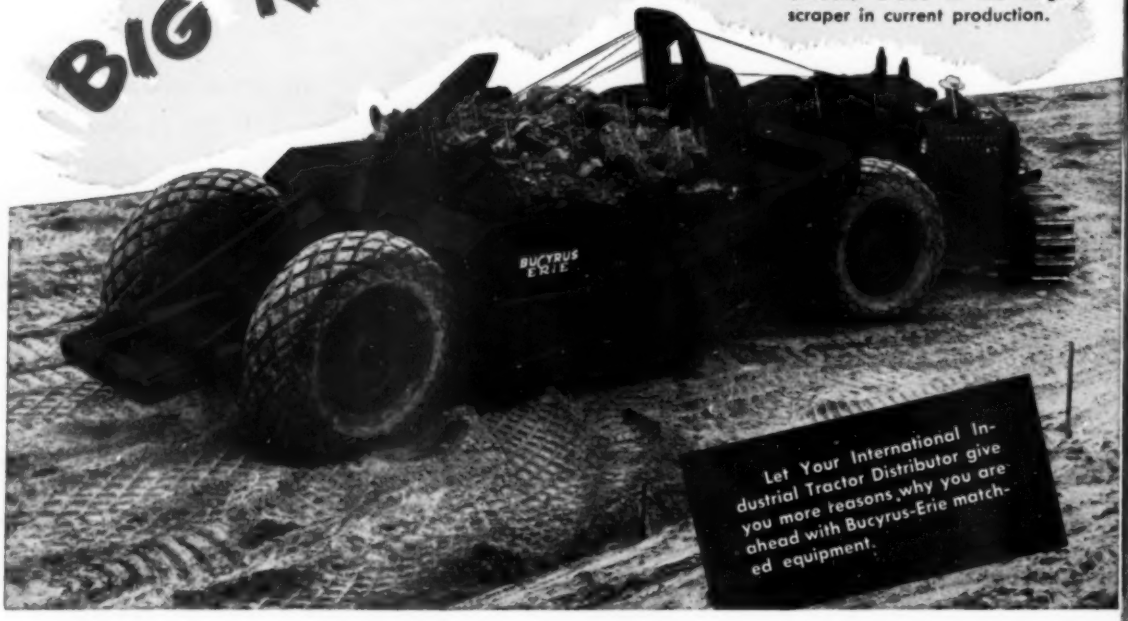
The BIG RED TEAM

Two Big-Capacity Scrapers work with the TD-24: The B-170A with 16-yd. struck capacity is the biggest of scrapers for loading without pusher help. The 22-yd. (struck) B-250 is the largest scraper in current production.



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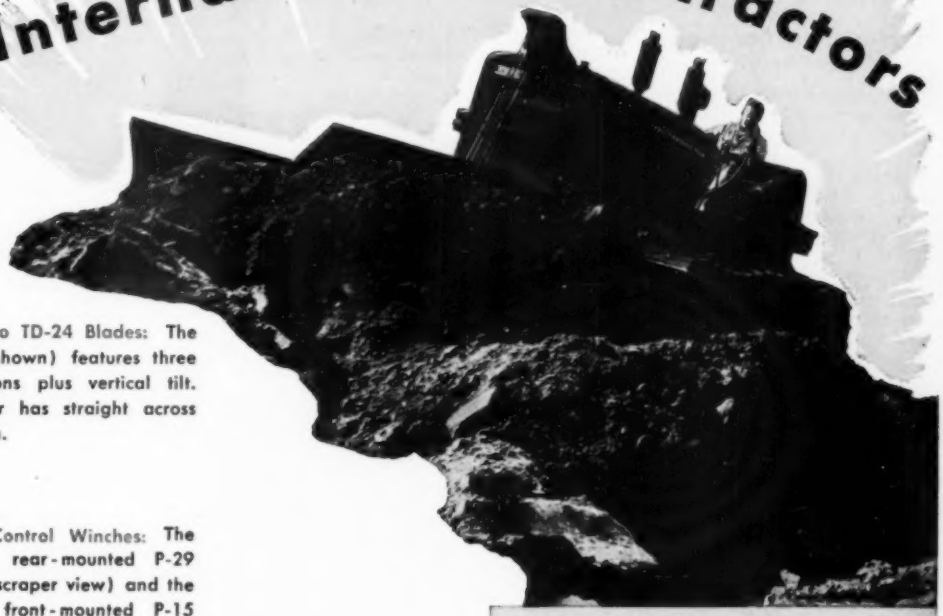


Choice of Two TD-24 Blades: The Bullgrader (shown) features three blade positions plus vertical tilt. The Bulldozer has straight across blade position.

Two Power Control Winches: The double-drum rear-mounted P-29 (seen in the scraper view) and the single-drum front-mounted P-15 (shown with the Bullgrader).

The CR-4 Ripper is designed to withstand the power of two TD-24's — one pulling and one pushing.

12752C

Four Pusher Plates: One mounts directly on tractor frame (shown here). Others mount on Bullgrader frame, Bullgrader blade or Bulldozer blade.

See Your International Industrial Tractor Distributor

News from the Field

Palisades Dam Construction to Start in Idaho

A Bureau of Reclamation contract for construction of the Palisades Dam and power plant on the South Fork of the Snake River about 50 miles from Idaho Falls, Ida., has been awarded to the J. A. Jones Construction Co., of Seattle, Wash., and the Charles H. Tompkins Co., of Washington, D. C., on a joint-venture low bid of $29,180,346.

Under the contract, work on the project which will be capable of producing 700 million kilowatt-hours of hydroelectric power annually must be begun within 30 days, with first generation of power scheduled in 1,700 days. The work is to be completed in 1,950 days.

Palisades Dam, a 260 foot high 2,000 foot long structure — the largest earth-fill structure yet built by the Bureau of Reclamation—will provide a 1.4 million acre-foot storage reservoir, furnishing supplemental water for 650,000 acres of irrigated farmland in the Snake River Valley and water to drive the three 39,500 hp turbines to be installed in the three-generator, 114,000 kilowatt power plant.

Preliminary open-cut and tunnel excavation work for the dam and power plant is already underway, under a separate contract awarded last December to J. A. Terteling & Sons, Inc., of Boise, Ida., on a low bid of $1,242,700.

Earlier last year, need for the project was emphasized by the Defense Electric Power Administration, which pointed out that the development of phosphate for defense needs, as well as power for the atomic energy installations at Arco, Ida., was dependent upon the availability of hydroelectric power from the Palisades project.

Urge U.S. Engineers to Publicize Work

American engineers were urged to tell the U.S. public that engineering genius has been greatly responsible for the differences in living standards in this country and those to be found in other countries.

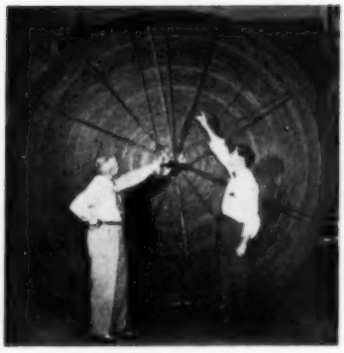
The vast benefits the U. S. public has gained from the work of American engineers have gone unrecognized because engineers themselves have not done an adequate job of publicizing their achievements, Hartley W. Barclay, industrial advertising manager of *The New York Times* declared.

Speaking before the annual meeting of the New York City chapter of the New York State Society of Professional Engineers, Barclay emphasized the need for "broader scale of communications for facts about the values, rewards, results, and practical public gains produced here by engineers."

As examples of some of the major engineering contributions to our society, Barclay cited flood control and waterway improvements; improved transportation and highways; improved water supply and storage; increased power generation and fuel supply; and reduced costs of industrial production and material handling.

Few persons in the engineering field, however, "have taken time to tell how these gains were achieved."

Barclay suggested that if such data



• This 1,814-ft. conveyor belt, making a roll almost 12 feet in diameter, presented an unusual problem for Goodyear Tire & Rubber Co.'s shipping department when it was called on to arrange transport of the unit from the firm's mechanical goods plant, Akron, O., to a customer in Indiana. A special low-boy was called in to make the haul, thus assuring bridge and underpass clearance. Doors on the company's shipping dock had to be removed to get the belt roll out of the mechanical goods plant. Loading on the truck was handled by means of pipe rollers.

• Equipment familiar to the excavating industry is lined up for a recent Chicago civil defense parade. Pictured here are several of the eight units the Speedway Wrecking Co. of Chicago had in the parade. Only the fire department had a larger "display." Periodically, units assigned to civil defense are alerted. Thus far Speedway has participated in four emergency drills.

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NO LAG ON THIS DRAG

In an 8-hour day this Bucyrus-Erie dragline handles about 1,600 yds. of sandy clay on a sewer trench job in St. Paul, Minn. Its 1-yd. bucket makes a swing every 19 seconds.

Steady going like that takes steady power behind it. A "Caterpillar" Diesel D318 Engine delivers that power, and here's what Mr. H. P. Phelps, Chief Engineer of Walter W. Magee Co., says: "Practically all our equipment is of 'Caterpillar' make. The machines are very will built, they're well serviced and they can be depended upon for many hours of uninterrupted service. We're well satisfied."

Walter W. Magee Co. is only one of thousands of owners all over the country who report the same satisfaction. So specify "Caterpillar" Diesel Engines for your own excavating equipment. Built in the world's most modern engine factory, they give tough, long-lasting service with low operating and maintenance costs. One example of built-in "Cat" economy: these Diesels operate without fouling on low-cost, non-premium fuels.

And if you need reliable power for any other purpose, the "Caterpillar" Dealer near you can help. See him soon, why don't you?

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TRACTORS • MOTOR GRADERS
EARTHMOVING EQUIPMENT

● As part of her plan to develop Africa's untapped riches, Britain is sending a scientific expedition to explore Uganda's fabled "Mountains of the Moon" — the 60-mile-long Ruwenzori Mountain range. It is believed to contain many valuable mineral ores. The trucks pictured are approaching the foothills of the Ruwenzori range. They are staking out a railway extension being built at a cost of over $8 million between Kampala and Kasese. Near this spot are extensive copper and cobalt deposits already being investigated by British and Canadian mining interests.

were more broadly circulated, it might go far "to insure a greater degree of future world-wide economic and social stability and international harmony. This is true because industry, engineers, and trade in the United States give all of the people practical benefits — benefits which people in other countries of the world can only dimly envisage."

Barclay estimated the total audience for engineering information at more than 15 million persons. When that audience is reached, he said, "a broader understanding of the results of engineering performances can be expected."

New Desert Conduit to Water Arizona Crops

The first gallons of water, coursing through a newly constructed desert conduit known as the Wellton-Mohawk Canal, are now bringing new life to thirsty acres of Arizona desert.

A few weeks ago the Bureau of Reclamation's Commissioner Michael W. Straus flipped a switch, turning the first water into the Wellton-Mohawk Division of the bureau's Gila reclamation project. Eventually 75,000 acres of desert will benefit from the plan to put irrigable land into production.

The Wellton-Mohawk Canal is actually a part of the Gila Project in which the Bureau of Reclamation is transforming the raw desert into thriving farms and welding them to an already established agriculture in the southwestern part of Arizona. The Gila Project consists of two divisions, the Yuma Mesa and the Wellton-Mohawk; together, the two involve 115,000 acres of land.

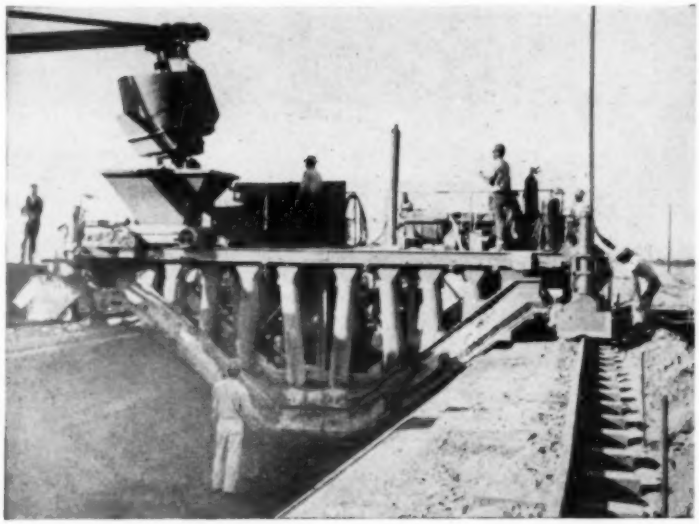
The Yuma-Mesa Division, comprising 40,000 irrigable acres, is made up of the Mesa, North Gila Valley, and South Gila Valley units.

The Wellton-Mohawk division, with its 75,000 acres, begins about 15 miles east of Yuma and extends up both sides of the Gila River for some 40 miles. Although most of the division lies in the river valley, some bordering mesa lands are included.

Agricultural history in the Wellton-Mohawk begins with the Pima Indians who were irrigating Gila River bottomlands in the early 1500's. The white man began settling the area in the middle of the nineteenth century and by 1875 a number of homestead filings had been made. Several thousand acres were brought under irrigation during

Continued on page 53

● Close-up shows method of pouring concrete into slip form made by Guntert & Zimmerman, and of a type used on Wellton-Mohawk project. Crane-loaded hopper car traverses the form.



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DIPPER
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Bolted sectional steel hulls for landlocked, inland waters

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FORT WAYNE 1 · INDIANA · U.S.A.

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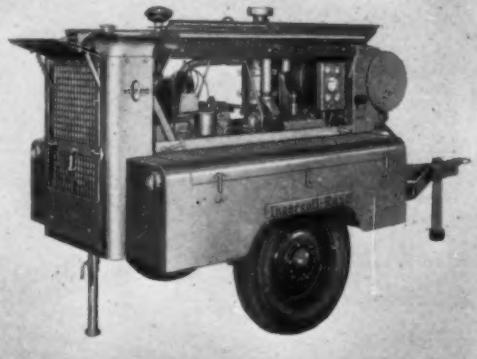
GYRO-FLO portable compressors

Ingersoll-Rand *Rotary* Mobil-Air

in capacities from 105 to 600 cfm



GYRO-FLO 105	Capacity, 105 cfm at 100 psi. Total weight, 2630 lbs. GM 2-51 diesel or Continental F-162 gasoline engine.
GYRO-FLO 210	Capacity, 210 cfm at 100 psi. Total weight, 4630 lbs. GM 4-51 diesel or Continental M-330 gasoline engine.
GYRO-FLO 315	Capacity, 315 cfm at 100 psi. Total weight, 5200 lbs. GM 3-71 diesel or Continental B-427 gasoline engine.
GYRO-FLO 600	Capacity, 600 cfm at 100 psi. Total weight, 9500 lbs. GM 6-71 diesel engine.

On any portable compressor job, the revolutionary GYRO-FLO can make important savings in the cost of *air power*. Because there are now four sizes of smaller, lighter, more efficient GYRO-FLO rotary compressors, one of them should be just right for your job.

No other portable compressor offers you all of these weight and cost saving advantages:

- No valves, pistons, rods or clutch.
- Smooth, quiet, vibration-free operation.
- Compressor maintenance practically eliminated.
- Up to 40% lighter—20% smaller.
- Oil-injection cooling, independent of engine cooling.
- Delivers oil-free air at temperatures under 200°F.
- "Air-Glide" capacity control holds pressure constant within 10 psi range at any capacity, and with minimum engine speed.
- Matched to nationally known diesel or gasoline engines.

Your nearest I-R representative will be glad to give you the complete GYRO-FLO story.

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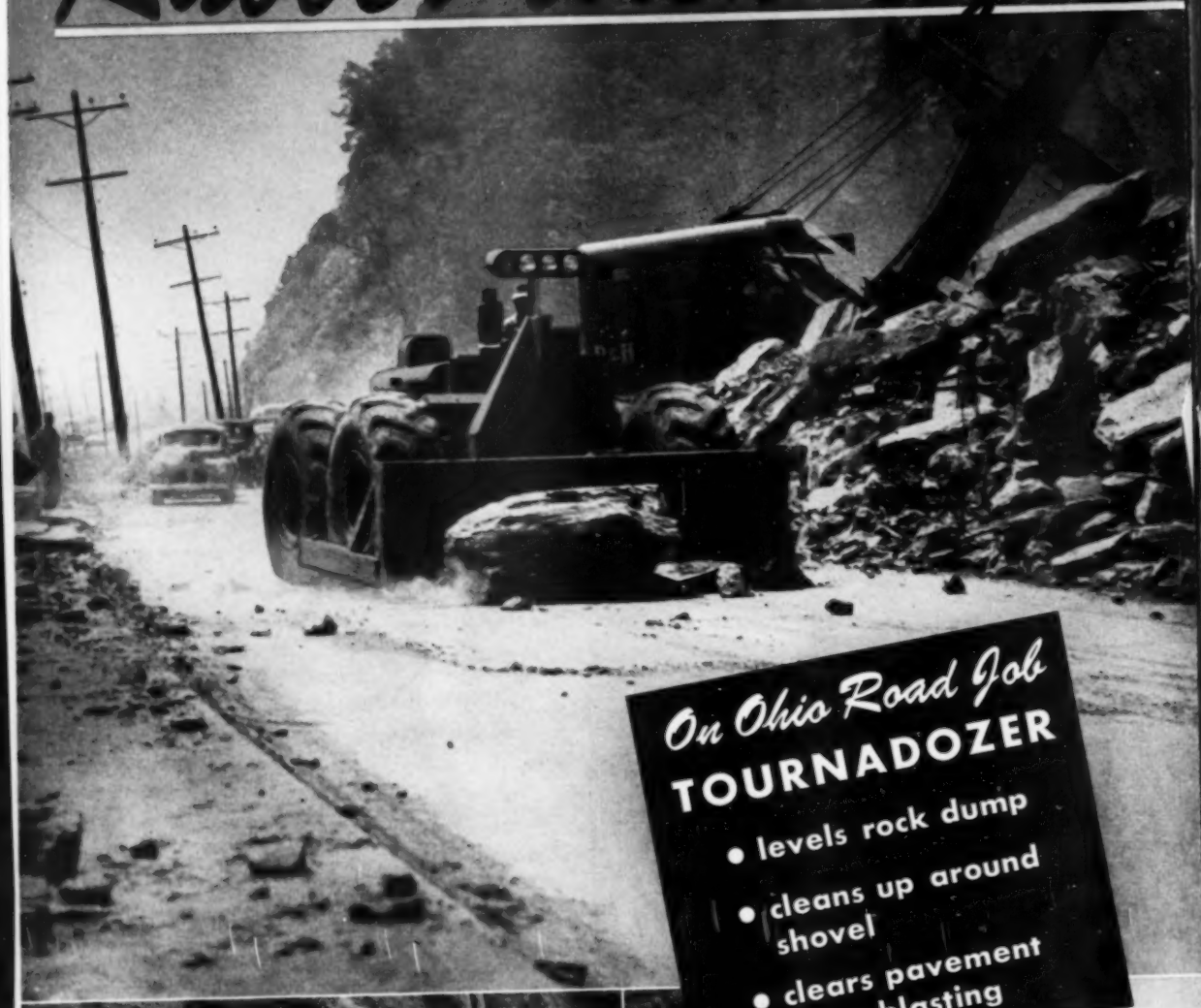
Rubber-tired dozer



On Ohio Road Job
TOURNADOZER

- levels rock dump
- cleans up around shovel
- clears pavement after blasting

LeTOURNEAU LET EQUIPMENT

TWICE AS FAST ON 85% OF YOUR DOZING WORK

travels 30 miles daily

eliminates crawler on dump and front-end loader in cut

The Red Eagle Corporation of Columbus is cutting 150,000 cu. yds. of shale and sandstone from the face of a steep, rocky hill bordering U. S. Highway 52 east of Portsmouth, Ohio, to prevent landslides. They solved the problem of widely-scattered dozer assignments economically by bringing in a rubber-tired C Tournadozer.

"This rig eliminated 1 rubber-tired front-end loader for cleaning pavement, plus a track-type dozer on the dumps," says Supt. Paul Brauning. It piles loose shale after dynamiting, cleans spillage from around the 1½-yd. shovel, keeps pavement clear of fallen rock, and levels the dump for 3 bottom-dump haulers.

When it gets ahead on these major clean-up assignments, the versatile Tournadozer drives about half a mile from the pit to work on grading of a site for a new bulk plant for a major oil company. In handling all these tasks, Red Eagle's Tournadozer travels 30 miles daily over busy Highway 52 . . . works 55 hours per week . . . at time this report was secured, had worked 3000 hours and had been 95% mechanically efficient.

You, too, will be surprised at the extra jobs you can handle per day and the extra production you can get per hour with one of these highly-efficient, 19 m.p.h., 186 h.p. C Tournadozers. Call your LeTourneau Distributor for field data that will help you estimate the production and savings you can make.

To keep U. S. 52 open to traffic while widening work is in progress, Tournadozer moves rock from pavement. Rig's 21.00x25 low-pressure tires do no damage to pavement or shoulders. Blade is controlled electrically. "*Entire electrical system has been 100% efficient,*" according to Supt. Paul Brauning.

R. G. LeTOURNEAU, INC.
Peoria, Illinois

In dredge-building,
there's no substitute for

UNDIVIDED RESPONSIBILITY

Selecting Bucyrus-Erie to build your dredge means that responsibility for it is undivided from design through construction.

Your job is surveyed in detail to determine the proper dredge design. Many years of varied engineering experience provide the background for thorough analysis of your dredging problems and recommendations for their solution.

Construction facilities unsurpassed in the industry go into the building of the dredge. Castings, forgings, weldments, heat treatment, and machining are subject to rigid laboratory control to make a top quality product. High-grade workmanship under close inspection assures a finished machine.

Assembly and final testing are under the supervision of Bucyrus-Erie engineers — the final product must meet specifications.

This undivided responsibility produces a dredge capable of long-time outstanding performance for *your* work.

120D52

BUCYRUS ERIE

SOUTH MILWAUKEE, WISCONSIN

News

Continued from page 48

the 1880's with brush dams and other head-works. But agriculture in the Wellton-Mohawk lands was rugged.

For more than 25 years farmers were plagued first by floods and then drought. About 1915 several wells were drilled and by 1931 some 11,000 acres were in cultivation. Increased diversion for irrigation upstream has progressively decreased flows in the Gila River until now, in normal years, there is seldom any surface flow through the area, and construction of Coolidge Dam upstream in 1928 and of dams along the Salt and Verde Rivers has reduced the flood flows available for recharging and sweetening of the underground water supply.

By 1934 excessive salt appeared in many wells and the water table had declined alarmingly. One after another, farms were abandoned. Spring floods in 1941 flushed large amounts of salt out of submerged Wellton-Mohawk fields and again provided good, fresh water for underground storage, and for the next two years agriculture enjoyed unprecedented prosperity. Since 1943 history has repeated itself.

The irrigation system on the Wellton-Mohawk division consists of three major canals with appurtenant structures, laterals, three main pumping plants and two smaller pumping plants. The Wellton-Mohawk Canal, 18.5 miles long, leaves the Gila Gravity Main Canal at a point just below the Gila River siphon and about 15 miles below Imperial Dam. Its branches, the Mohawk and the Wellton Canals, extending about 44 and 20 miles respectively, will convey water to their respective lateral systems. Work on the Wellton-Mohawk Canal began in August, 1949.

The first 8.5-mile section was let to the Fisher Contracting Co. of Phoenix and involved 3,250,000 yards of excavation for a clay-lined, trapezoidal-shaped canal with a bottom width of 44 feet to carry water at a depth of 8.76 feet. Fisher used a Bucyrus-Erie 120-B electric-powered dragline with a 90-ft. boom, swinging a 7-yd. bucket in light soil and a 5-yd. bucket in heavier ground. It excavated to an average depth of 27 feet, with 54 feet across the bottom and a 2:1 slope on the sides.

A Koehring 84 swinging a 2-yd. bucket was used to trim the sides and keep the cut to nearly exact size, conserving much of the clay lining material. In addition to the earth moved by the draglines, Fisher used a group of five Caterpillar D8 tractors with rippers and scrapers to tear out some 250,000 yards of decomposed rock. This equipment alternated between ditch work and pit stripping to supply the compacted clay earth fill for eight feet of horizontal lining. The bottom was lined with clay obtained from the Gila mountains.

The next stretch of the big ditch was handled by Morrison-Knudsen Company, Inc., Boise, Ida. The 9.4-mile section is concrete-lined with 16-ft. bottom width to carry a 12.8 ft. water depth. This section begins at an elevation 31 feet above the clay-lined section and four miles later jumps up another 84 feet. In addition the M-K job required a 241-ft. tunnel of 18 x 18-ft. cross section, under the double-tracked main line of the Southern Pacific railroad. Total earthmoving involved about two million yards.

Putting on the bite was a Bucyrus-Erie 200-W dragline swinging a 7½-yd. bucket in sand and a 6-yd. bucket in clay. Digging was to an average depth of 35 ft. through a group of low hills, with 54 ft. the maximum cut. Teamed up with the big rig was a D8 and dozer with wings which hiked the dirtmoving operation by 2,000 to 3,000-yds. per day. In some places along the bottom of the canal a 2½-yd. Northwest 95 dragline was used to build up the cut where the ground was low. Fill was compacted with an 8-ft., double drum sheepsfoot packer in a maximum of ten passes.

Western Contracting Corp., Sioux City, Ia., and Marshall, Haas, and Royce of Belton, Calif., are working on contracts for the 44-mile Mohawk ditch, and M-K on an 11.7-mile section of the Wellton ditch. Construction on laterals for the Wellton and Mohawk distribution systems is also scheduled.

• A new, faster method for simultaneous blacktop removal and ground releveling is being used on the 160 acre job at Camp Beale, Marysville, Calif. Caterpillar dozer blades are equipped with removable rippers that rip blacktop loose and stock it in piles during the releveling operation. Stolte, Inc., and Gallagher-Burk Inc., contractors on this $5.5 million job, anticipate substantial savings through the elimination of a separate scarifying operation. The tractor assembly photographed is equipped with the removable ripper teeth, manufactured by Hensley Equipment Co., San Leandro, Calif.

M-K used a canal liner and trimmer on its Wellton job, equipment built by the construction division of Guntert & Zimmerman of Stockton, Calif. This custom-built equipment is powered by Caterpillar Diesel electric sets.

Western Contracting used its own specially-built canal trimmers and liners on its contract to complete 2½

• Two-and-a-half yard shovel drops about five tons per shovelful of jagged rock diggings into E. F. Robinson Co. truck working on the Penn-Lincoln Parkway job in Pittsburgh, under contract to B. Perini and Sons, Framingham, Mass. Robinson trucks were fabricated of Jones & Laughlin Otiscoloy high-strength steel and Jalloy heat-treated plate by the Penn Body Division of the Hockensmith Corp., Penn, Pa.

miles per week. A Caterpillar D17000 Diesel electric set furnishes power for the slip form, and two D8800 engines and a D13000 electric set power the ditch trimmer while two D3400 electric sets power the finishing platform and caulking platform.

Canal trimmers do their work by means of an endless chain of drag buckets which skim laterally over the canal contours on a fixed line of excavation and dump onto a conveyor that spills the waste outside the canal. Then comes a paver, a traveling, concrete-placing plant that lays and finishes a three-directional slab of concrete walls and bottoms as it moves along.

Cost of the project is estimated at $38 million including operation and maintenance during the contract period. This will be repaid over a 60-year period by users, with the time of repayment to start in ten years.

Oil Man Applys Heat to Limited Road Plans

Even the most nondescript "jalopy" in America today is powered by better fuel than Lindbergh could buy when he flew the Atlantic. This was said by L. S. Wescoat, president of The Pure Oil Co., in a recent address at the Hotel Mayflower in Washington, D.C. before hundreds of delegates and guests

• "American ingenuity has more than tripled the amount of materials, energy, and performance going into a mile of road today." — L. S. Wescoat.

of the Fourth Highway Transportation Congress, sponsored by the National Highway Users Conference. "Transportation, Unlimited" was the theme of Wescoat's presentation and, to illustrate the practical application of the free enterprise system, he reviewed the strides made in highway transportation during the past 25 years.

In the early days of the automobile, he pointed out, bankers took a dim view of the future of the industry and, as a result, sat back and watched the new and profitable business of automobile financing pass into other hands. A U.S. Senator urged legislation to make it a crime to drive an automobile on public highways "until horses are educated to the point where they will not be afraid of them." An editorial in the *New York World* protested that automobiles used so much leather that they were forcing the price of boots and shoes out of the poor man's reach.

"Those were the days of transportation, limited. What limited it? Nothing but the lack of human vision and technical know-how."

Our capitalistic system, Wescoat pointed out, has made today's automobile, based on useful life, 72% cheaper than its 1925 counterpart. Better gasoline in better engines, lubricated by better oil have increased power, acceleration, and miles per gallon by 50% he declared. While the cost of highway construction per mile has tripled in a quarter century, he said that American ingenuity has more than tripled the amount of materials, energy and performance going into a mile of road today.

"Petroleum, motor vehicles, and highways also illustrate, like a lighthouse lamp, the 'great multiplier' of modern science, invention and technology — the tremendous significance of which is just beginning to penetrate the thinking of mankind. Better gasoline and lubricating oil help sell more cars; better cars help sell more gasoline; better highways help sell both cars and gasoline; and better cars and gasoline build better highways," Wescoat reminded his listeners.

Referring to the road and street bottlenecks now confronting highway transportation progress today, the petroleum industry leader urged cooperation and wholehearted support of PAR — Project-Adequate Roads — recentiy inaugurated nationwide movement to get America out of the traffic muddle. The PAR program seeks to promote sound highway programming in the states through the use of the sufficiency ratings system — whereby roads can be rated numerically according to their structural condition, safety features, and ability to give service.

A new booklet, *PAR—What It is—What It Does*, tells how the national PAR was formed and gives suggestions on how to organize state and local PAR groups.

This booklet is available in quantities on a production cost basis of 5c a copy plus shipping charges. Address orders to: National PAR Committee, 952 National Press Bldg., Washington 4, D.C.

Built . . . for Work!
Omaha Dragline Buckets are built for the extra-tough digging jobs. Unnecessary weight eliminated —a bigger payload built-in. Successful contractors everywhere in the U. S. A. are using Omaha Buckets for a greater volume of work . . . for bigger profits. Available in four types to fit your needs. Write today for catalog giving complete information and specifications.
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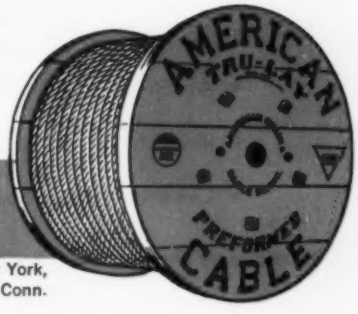
TRU-LAY Preformed WIRE ROPE

● For each use there is *one best* wire rope . . . one that will stand repeated loading, abrasion, crushing, or continuous bending, and be the best rope to buy.

To achieve this, there is a TRU-LAY Preformed Wire Rope made in a special construction for your equipment. This construction has the exactly right combination of strength, bending life, and resistance to wear and crushing that you need.

The one best wire rope . . . TRU-LAY Preformed . . . will last you longer and cost less to use. Specify and get TRU-LAY Preformed improved plow steel—the rope identified by the Green Strand.



ACCO

TRADE MARK

AMERICAN CABLE DIVISION
AMERICAN CHAIN & CABLE

Wilkes-Barre, Pa., Chicago, Denver, Houston, Los Angeles, New York, Odessa, Tex., Philadelphia, Pittsburgh, San Francisco, Bridgeport, Conn.

A Forecast by MARION

THIS NEW MARION 191-M . . . .

. . . is the world's biggest loading shovel — the biggest two-belt crawler shovel built. It is shown at work loading stone for a big construction project in Kansas. The 191-M has loaded up to 1,600 yards an hour in big 10-yard bites that fill trucks in the 50-ton class in 3 passes.

MARION predicts the 191-M will have a bright and busy future in construction. Some of the reasons:

- 10 Cu. Yd. Standard Shovel with 43′ 8″ Boom & 27′ 4″ Handle
- All-Electric or Diesel Electric Power, Ward-Leonard Control on Both
- An extremely Heavy-Duty Shovel with Small-Machine Cycle Time
- Greater Travel Speed and Maneuverability than most smaller machines

For more of the reasons, write, wire or phone Marion Power Shovel Co., Marion, Ohio Since 1884. Offices in all Principal Cities

NOT in the *Contract*

Boss: "What do you want? I fired you two weeks ago."

Office Boy: "I came back to see if you're still in business."

Circus Manager: "You're pretty small to be a wild animal trainer."

Applicant: "Say, that's the secret of my success; they're waiting for me to grow a little larger."

Detective: "I'll need a description of your missing cashier. Is he tall or short?"

Banker: "Both."

Then there's the one about the British bulldog, the French poodle and the Russian wolfhound ambling along the Rue de la Paix.

They compared notes. The bulldog said things were rugged in London. Rations. The poodle thought they were worse in Paris. They turned to the wolfhound. "It's different in Moscow," he said. "Fat steaks and juicy bones every day."

"Then why did you leave?" they chorused. And he whispered, "I wanted to bark."

Doctor: "I want to make a change in the death certificate of Mr. McWhorterfield."

City Clerk: "Anything wrong?"

Doctor: "I signed my name in the space marked cause of death."

An icy voice cut into an uninhibited telephone conversation, "Do you know whom you are addressing?"

"No," said the sergeant.

"Well, this is Major Throckmorton."

"Major," said the sergeant, "do you know whom you are addressing?"

"NO!" thundered the major.

"Thank God!" said the sergeant and hung up.

Doctor: "You must avoid all forms of excitement."

Patient: "Can't I look at them on the street?"

Shovel Runner: "Sir, may I have your daughter for my wife?"

Father: "Trot your wife around and I'll see."

A husband went out with the boys one night, and before he realized it the next day had already dawned. He hesitated to call his wife, but finally hit upon an idea.

"I'm back!" he shouted into the phone. "Don't pay the ransom!"

"What are we having for dessert tonight dear?"

"Sponge cake. I sponged the eggs from Mrs. Brown, the flour from Mrs. Smith, and the milk from Mrs. Jones."

Lady: "Could you please tell me where I'll find some silk covering for my settee?"

New Floorwalker: "Two aisles over, Ma'am, for the lingerie department."

"My husband plays tennis, swims and goes in for physical exercise. Does your husband take any regular exercises?"

"Well, last week he was out seven nights running."

The scene was a saloon in the far west and around the table was gathered as tough a gang as could be found in the whole of Nevada. The game was fast and furious; the stakes were high.

Suddenly the dealer flung his cards on the table, and threateningly pulled out his six gun.

"Boys, this hyar game ain't a straight one! Slippery Sam ain't playin' the hand I dealt him!"

She was only a gravedigger's daughter, but you ought to see her lower the beer.

"Mandy, why do you call your child Opium?"

"Cause he's the product of a wild poppy."

The most observant person was the historian who noticed Lady Godiva had a horse with her.

Someone asked a police captain if it was true he was brought up in a tough neighborhood.

"Tough?" said the copper. "Why it was so tough in our neighborhood a cat with a tail was a tourist."

"He gives them part of his lunch and they wake him up when they see the boss coming."

Equipment You Ought to Know About

Truck Bodies

Manufacturer: Galion Allsteel Body Co., Galion, O.

Claims: A new line of side dump truck bodies for heavy duty applications is known by the name "Roll-over." They are available in a wide variety of sizes and capacities.

Entirely mechanical in operation, the Roll-overs dump to either right or left side, as desired. Bodies are of 10 gauge steel, can be mounted on all standard trailers, and will withstand the most severe service. The self-contained subframe consists of three heavy box type outrigger cross members. Front and rear outriggers are built with a series of gear-like teeth which roll inside the formed channel tracks welded to the body. This construction locks the body in a stationary position and prevents forward or backward movement of the body on the subframe.

Main locking mechanism is a down-pull spring-loaded type plunger pin which engages in a socket built into an angle welded to the head of the body. Lock pin is actuated by a lever mounted to an A-type frame welded to the front of the subframe. Lever can be operated from either side of body.

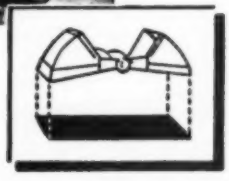
To effect dump operation, driver disengages the spring lock chain on the opposite side of the body to which load is to discharge, then releases plunger lock lever. Bodies can be righted manually or by a slight snaking movement of the truck.

Roll-overs are particularly recommended for use on general construction projects, coal shipping, metal mining, quarrying, stockpiling, etc.

In addition to their single unit use, Roll-overs can be employed in "trains" by installing one or two bodies on a trailer, and a third or fourth on an attached dolly trailer. With the "train" system, more than 50 yards of material can be handled with one tractor.

ERIE *Barge Type* Bucket

In this type the large deck area achieved means bigger payloads in stock piling and barge rehandling work. Erie's booklet on 2-line buckets gives you complete data on this type and 3 other classes of Erie Buckets. Write for copy today.



***Compare* DECK AREA**

¾ Yd.	27.21 Sq. ft.
1 Yd.	30. Sq. ft.
1¼ Yd.	32.3 Sq. ft.
1½ Yd.	38.7 Sq. ft.
1¾ Yd.	42.4 Sq. ft.
2 Yd.	45.1 Sq. ft.
2¼ Yd.	53.5 Sq. ft.
2½ Yd.	57.6 Sq. ft.
3 Yd.	68.9 Sq. ft.

Write for Catalog **2L-2** *Today*

ERIE
STEEL CONSTRUCTION COMPANY

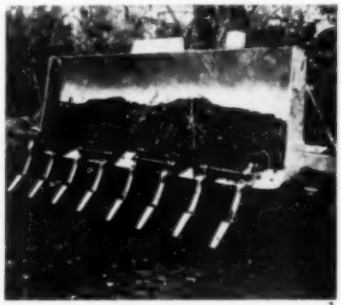
428 GEIST ROAD • ERIE, PENNSYLVANIA

Brush Rakes

Manufacturer: Hensley Equipment Co., 878 Joaquin Ave., San Leandro, Calif.

Claims: With these clearing units it is possible to convert a standard dozer blade into a brush clearing blade in a matter of a few minutes. The units can be quickly removed and the dozer can operate in its normal way. These units were job tested to do all jobs expected of a standard clearing blade.

The photo shows four units mounted on a dozer. These units are designed to uproot the brush, thoroughly comb the roots and debris out of the soil,



make it possible to burn the stacked brush, which is comparatively dirt free.

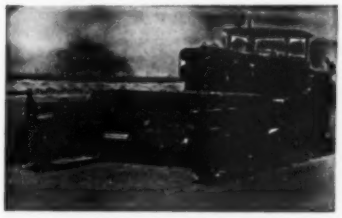
A unit consists of two shanks fastened together with the desired spacing and with all necessary parts, ready to use when received. The manufacturer recommends three, four, or five units for desired coverage. The rippers will readily fit most standard type dozers without any adjustments.

Spreader

Manufacturer: Tractor Spreader Co., Hasbrouck Heights, N. J.

Claims: The new Model 100 Jersey Spreader, a tractor mounted stone spreader with capacity up to 20 tons per minute, features an exclusive strike-off adjustment that permits varying depths of spread from a minimum of 1 inch up to 12 inches. Adjustable bleeder gates allow a variable width of spread from 10 to 13 feet in 3-in. increments.

The Model 100 is designed for use with the heavier crawler-type tractors and is mounted on the push beams of the dozer after the blade has been removed. The adaptation can be made without special attachments to most



tractor-dozer combinations. It can be used with either cable controlled or hydraulic dozers by simply pulling the pins and mounting in position on the push beams.

No special accessories or attachments are required for feeding stone from any type dump truck directly into the hopper. The truck is backed up to the hopper and the body raised. The forward movement is controlled by the tractor operator as the truck, steered by the driver, is pushed along.

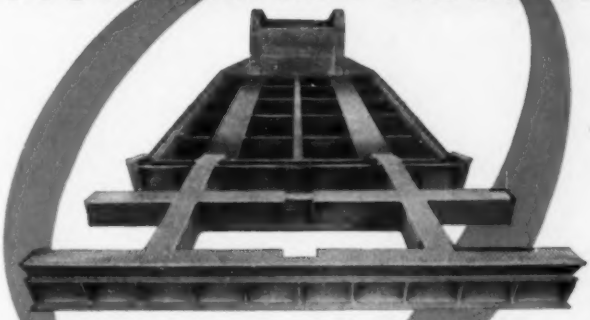
The spreader handles stone of any size from ¾ inch up through the normal macadam range and certain subgrade materials. Overall width is 12 feet; overall height 48 inches and weight (without tractor) 4,200 pounds.

Scraper

Manufacturer: Wooldridge Manufacturing Co. of Sunnyvale, Calif. and Chicago, Ill.

Claims: A new 22-yd. tractor-drawn scraper is called the TC-190. Designed for use with today's largest

Where Else Can You Buy
"A STANDARD TRAILER"



with ALLOY STEEL MAINBEAMS
for Lightness with Strength & Elasticity

There's no need for "splitting hairs" on the matter of load weights when you're hauling with a Rogers Trailer. Rogers standard practice of incorporating Mayari R Alloy Steel in all main frame members for strength with lightness affords the necessary elasticity for deflection under load and return to normal after unloading.

Before you purchase any trailer, check the Safety Factor rating. You'll find Rogers offers the maximum.

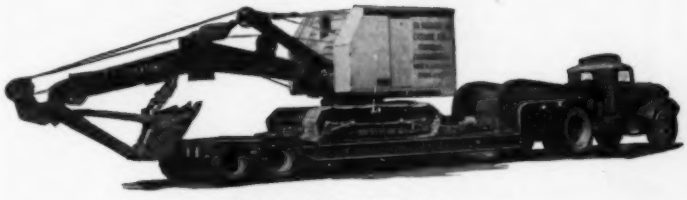
WRITE FOR THE LATEST CATALOG

YOU GET MORE FOR YOUR MONEY in a ROGERS TRAILER

EXPERIENCE builds 'em — PERFORMANCE sells 'em

ROGERS BROS. CORP.
ALBION, PENNA.

136 Orchard Street



A Rogers Type "D" Trailer

The most productive BLAST HOLE DRILLER

● Time and again McCarthy Drills get the nod from operating men . . . men who've made actual tests proving that no other equipment can match a McCarthy for speed, stamina and versatility.

At the Bessemer Limestone and Cement Company, Bessemer, Pa., one McCarthy unit averages 90 ft. per hr., working through a facing of blue shale 34 ft. deep. Holes are drilled on 18-ft. centers. Two men handle the whole job, including setup and moving. Another McCarthy unit has been installed in a different section of this quarry and it, too, is breaking all previous records for fast, low cost shot hole drilling. McCarthy Drills operate with all types of power units on all types of mounts. Write today for full facts about this finger-tip controlled money saver.

SALEM
THE SALEM TOOL CO.
773 S. ELLSWORTH AVE.
SALEM, OHIO · U. S. A.

tractors, the new model offers capacities of 19 cu. yds. struck and 22 heaped. Standard equipment calls for 21:00 x 24 tires front, 24:00 x 25 rear. New type side cutters of manganese alloy steel are bolted on to protect bowl side sheets. For rocky terrain and extremely tough material, optional oversized side cutters of extra thickness and strength are available.

The TC-190 was engineered to meet specific requests by contractors for a larger scraper with basic characteristics of current models TC-142 and TC-170. Rapid loading results from latest application of the "boiling bowl" principle. Positive fast dumping with less tractive effort is achieved by a rolling motion applied by the ejector,

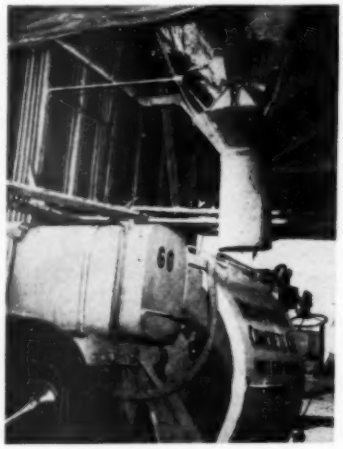
pivoted at the blade base. Among other features are simple cable reeving and long cable life, and maneuverability aided by low gravity center with high ground and yoke clearance.

Rubber Hose

Manufacturer: United States Rubber Co., Rockefeller Center, New York 20, N. Y.

Claims: A new rubber hose for the construction industry can be used to transfer concrete from batch mixer to trucks at a considerable saving in time and cost.

Although the first cost of the hose is higher than the canvas spout usually used by ready-mix concrete companies for this purpose, it is more economical



in the long run because it lasts at least six months whereas canvas is usually good for an average of one week. Users say the hose remains flexible throughout its life while canvas absorbs the concrete and becomes stiff.

The hose is also easier to clean and is free of clogging. A major cost-saving factor is that trucks and other expensive equipment will no longer have to be kept idle at frequent intervals to change the canvas spout.

The new hose is made in various sizes ranging from 18 to 24 inches in diameter and from 18 to 36 inches in length. It is made of natural rubber reinforced with two plies of special fabric. In use, one end is attached to the bottom of the batch mixer and the other end hangs free over the hopper of the truck to be loaded.

Power Steer Booster

Manufacturer: Air-O-Matic Power Steer Corp., 24 Noble Court, N.W., Cleveland 13, O.

Claims: A low cost, fully automatic, compressed air-operated power steer booster provides easier, safe steering of trucks, tractors, moto-cranes, off-the-road and heavy road construction equipment, military, and other specialized vehicles. The device aids vehicle steering and can be adjusted by operator at instrument panel to give de-

sired amount of steering assist for any load, condition of road, speed or any combination of these variables.

The compact, self-contained, lightweight power steer booster is constructed mainly of anodized aluminum. It utilizes compressed air for its power. It requires few fittings for easy and quick installation on old or new vehicles without altering or removing any part of the steering mechanism. One end of booster is fastened to a stationary member of vehicle. The other end of the accessory is attached to a movable part of the steering linkage (pitman arm, drag link, tie rod, etc.) Only one air line is needed. The device requires no oiling, and can't jam or freeze. Maintenance cost is low because there are no reservoirs to fill, no expensive pumps to replace, no fluid to leak away.

The rust and corrosion-resistant booster automatically assists as driver turns steering wheel and provides easy-action vehicle steering in maneuvering through heavy traffic, loading or unloading at docks, in and out of parking places and narrow entries. The device assures dependable, trouble-free

performance on construction jobs where the ground is soft and in sand or gravel pits. It provides easier steering reducing driver fatigue to assure more efficient vehicle operation with greater safety.

Pusher Unit

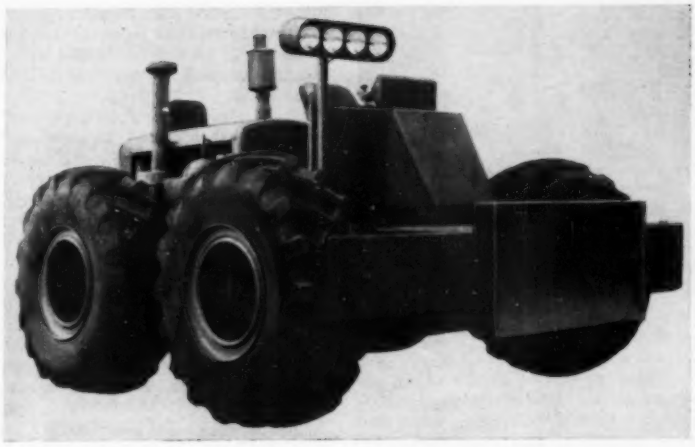
Manufacturer: R. G. LeTourneau Inc., Peoria, Ill.

Claims: A new pusher unit, called the Tournatractor, is offered for contractors who are using dozers exclusively as pushers.

The pusher is a new version of the Super C Tournadozer with the dozer blade, power control unit, A-frame and dozer controls omitted. In place of these is a billet, 3x15 inches and spanning the width of the machine. On the billet the manufacturer has placed a large pusher plate.

The unit can be equipped with a torque-converter as original equipment and is equally adaptable to pulling operations, either with a rear power control unit or with its drawbar alone. If later the need for a dozer develops, the billet and pusher plate can easily be removed and the A-frame, power control unit and dozer added.

The pusher is offered with a variety of tire choices to meet various job conditions.



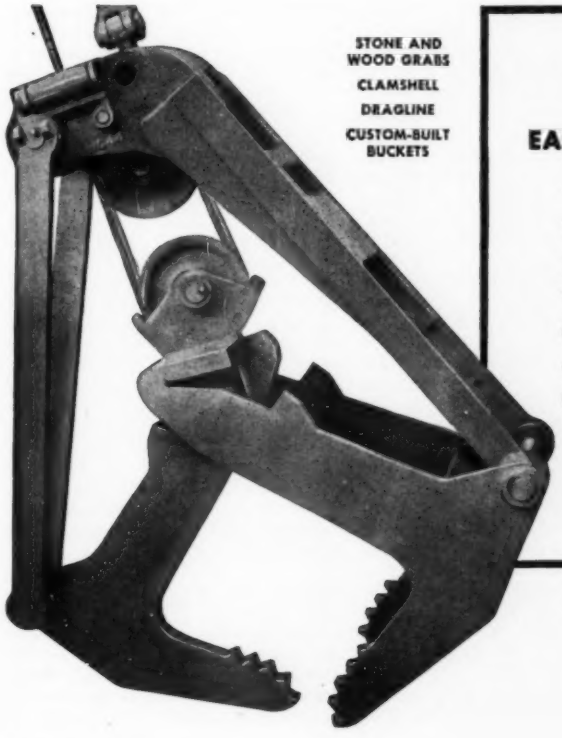
Truck Crane

Manufacturer: Pitman Manufacturing Co., Kansas City 5, Mo.

Claims: Now in production is a new model of the Hydra-Lift, recently-developed crane with hydraulically-powered boom that can be mounted on the frame of any truck, 1½ tons or larger.

The new Model "B" features a variety of improvements over the original production model, introduced late in 1950. The crane requires 40 inches behind the cab of a truck, has a loadline capacity of 6,400 lbs. and a swinging boom which telescopes from 12 to 17 to 22 feet.

The two chief improvements in the



STONE AND WOOD GRABS
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WELLMAN

EASY HANDLING OF LARGE STONES

● Those big stones won't slip from the Wellman Stone Grab. Four-part closing cable reeving develops tremendous closing force on stones. Model shown has 5-ton capacity, 4½ foot jaw spread. Other capacities available.

Want Facts? Send for free descriptive bulletins.

THE WELLMAN ENGINEERING COMPANY
7000 Central Avenue
Cleveland 4, Ohio

new model are (1) an increase in the unit's safety margin and (2) the fact that it now is shipped almost completely pre-assembled.

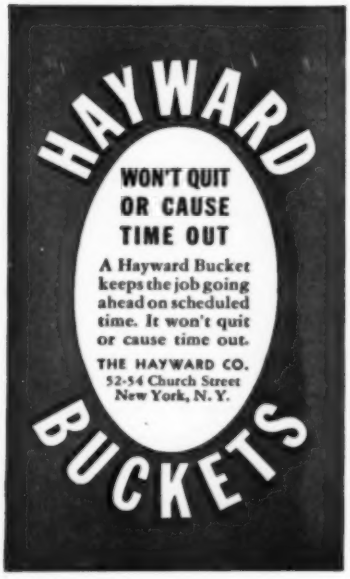
Rated capacities of the crane are based on the tipping factor of a 1½ ton truck, with outriggers down, and thus have not been increased. But the wider safety margin means less strain is placed on the crane when any given load is picked up. This in turn means less maintenance trouble and longer crane life.

Briefly, safety margin has been increased by raising about 18 inches the point on the crane's mast where the topping cable is anchored. This results in a wider angle between the boom and topping cable, giving the boom better lifting advantage.

Other changes which have improved operation are the addition of a bail bar on the topping cable and replacement of the old hammerhead boom-tip casting with a new casting of swivel design.

The bail bar serves to strengthen the topping cable rigging. The swivel boom-tip casting permits use in closer quarters, since even though a load is at an angle to the boom it can be winched in with no damage to the winch cable.

Other improvements include lever controls, rather than the push-pull type. The manufacturer also announces it now has available a special set of controls for operation of the crane outside the cab.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WON'T QUIT
OR CAUSE
TIME OUT
A Hayward Bucket keeps the job going ahead on scheduled time. It won't quit or cause time out.
THE HAYWARD CO.
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New York, N. Y.
BUCKETS

Front-End Loader

Manufacturer: Drott Manufacturing Corp., Milwaukee, Wis.

Claims: A new line of Drott Skid-Shovels is built exclusively for International tractors in these models and

capacities: TD-9 — 1¼ yds., TD-14A — 2 yds. and TD-18A — 3 yds.

The hydraulics are fully enclosed and protected. The rear end is free for mounting auxiliary equipment and a low overall clearance permits work in confined areas.

A patented feature called "Break-Out Action" gives the bucket a crowding action at every bite, assuring a heaped load from any cut. The bucket is rolled back as much as 28 inches before the load is lifted, and that extra yardage does not slip off the heap. The force of this prying action is transmitted through the loader shoes into the ground.

Loads are transported with the shoes skidding on the ground, giving the operator good visibility. Even over rough terrain, balance is maintained. Shoe transportation eliminates "carry strain" which other front-end loaders must bear.

Another feature, which is standard equipment on the Skid-Shovel, is the Hydro-Spring. A pressure line running from the main lift rams to the Hydro-Spring puts the hydraulic system under spring tension and reduces hydraulic shocks by two-thirds. A tool box is located just above the Hydro-Spring compartment.

By lever arrangement, action of the bucket control cylinders is reversed to provide greater power for digging and speed for dumping. A depth gauge indicator on the bucket control ram enables the operator to adjust his depth of cut to within a fraction of an inch. The oil gauge dip stick is magnetized, and foreign matter is removed each time the oil level is checked. The Skid-Shovel has higher lift and farther pitch than any other loader in the same capacity range.

Production for the International TD-6 is scheduled for fall.

Faceshield

Manufacturer: United States Safety Service Co., Kansas City 6, Mo.

Claims: A new and improved type of faceshield, known as "The Halo," has been developed recently. Attractive appearance, light-weight, and comfort are claimed by the manufacturer through the use of cellulose-acetate-butyrate materials in the headgear.

A new feature is an all-green plastic spark protector, which affords wide-angle vision, and still eliminates glare from overhead lighting. Another new development is a patented visor lock which locks the visor in the "up position" or the "working position," and eliminates the chance of the wearer adjusting the visor so it does not afford full protection.

The faceshield is available in three styles of headgear with clear or green

visors, and a special acid resistant visor for use around acid and chemicals. The shield weighs less than six ounces.

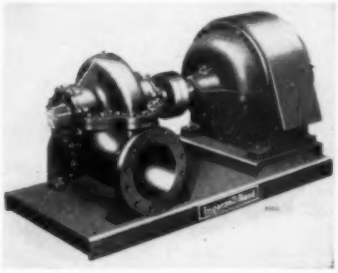
Pumps

Manufacturer: Ingersoll-Rand, 11 Broadway, New York 4, N. Y.

Claims: Further advanced design improvements in a line of small, single-stage, double-suction pumps is an-

nounced. These pumps, known as the Class DMV-DHV, are the first to incorporate double mechanical shaft seals with sealed, pre-lubricated ball bearings. The result is a compact, totally enclosed pumping unit that requires minimum attention and maintenance and reduces floor space requirements. Built in 3, 4, 5, and 6 inch sizes, the DMV (for medium heads) and the DHV (for high heads) are designed for general hydraulic services at temperatures up to 200° F, capacities to 2,100 gpm and pressures to 150 psi.

The use of a double shaft-seal affords the advantages of more efficient



sealing and prevents air leakage into the pump when it is operating under suction lift. The double seal also has a longer service life under conditions when the pump is handling gritty and abrasive liquids, since external sealing liquid is injected to the seal box under pressure — lubricating the seal faces and preventing the gritty fluid from reaching them.

The cartridge type, permanently lubricated ball bearings, successfully used in motors of nationally known make, are packed with lubricant by the manufacturer and require no further lubrication throughout their service life.

Casing design has been made more compact and simple in these pumps, with better hydraulics and higher efficiency the result. The elimination of stuffing boxes has decreased the shaft length between bearings, making the carefully finished shaft more rigid. The shaft is not threaded, reduced or slotted at any point over its unsupported length. This construction eliminates any point on the shaft where stress concentration — and possible fatigue failure — might occur. The impeller is attached by a shrink fit, similar to the method of mounting high pressure turbine wheels.

Through standardization possible with this improved design, three spare parts kits serve all eight pumps in the DMV-DHV line. These specially designed kits contain all the parts any mechanic would require to restore the pump to its original performance.

Standard materials—cast iron casing, carbon steel shaft and bronze impeller — are used to equip the Class DMV-DHV pumps for any non-corrosive service.

Metal Culverts

Manufacturer: Penn Metal Corp. of Penna., Philadelphia 48, Pa.

Claims: A new Penco product, nestable corrugated metal drainage pipe was developed principally for export and long distance shipment. With current production going to U. S. military forces, nestable pipe is expected to fill a growing need for drainage pipe that can be shipped more economically than conventional full-round pipe. Nestable pipe consists of flanged half-round sections which are bolted together in the field to form tight, continuous conduits. Shipped knocked down, it requires only about 10% of the shipping space of full-round, factory-assembled pipe.

Nestable pipe is a practical type of drainage pipe for overseas shipment and long overland hauls, even in diameters as large as seven feet. Though light in weight, it carries heavy traffic loads when installed under highways, railroads, airports, etc. In addition to the U. S. government, anticipated markets for nestable pipe are expected to be foreign governments, and U. S. mining and construction industries which are expanding abroad as well as in more remote sections of the United States.

Conveyor

Manufacturer: American Conveyor Co., Chicago 7, Ill.

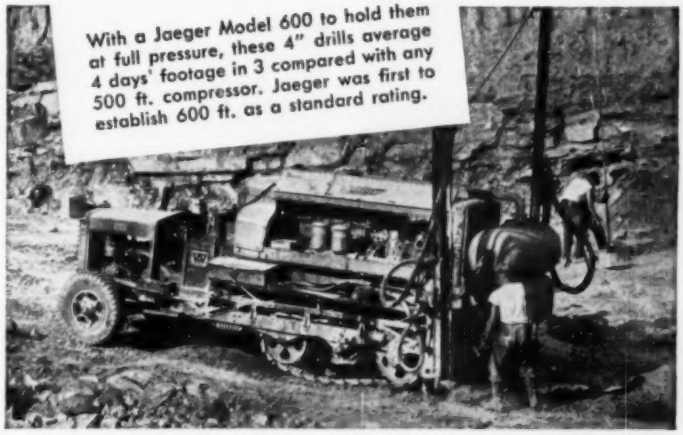
Claims: The Con-vay-it special 12-30 is mounted on both the International Farmall Cub and Super A.

This conveyor is more versatile in its applications than the previous contractor's conveyor. However, it is not altered except in the mounting and application of hydraulic power from the tractor instead of the air-cooled engines and electric motors which were previously used.

The conveyor is being used successfully to handle wet concrete, bricks, concrete blocks, lumber, pipe, sand, gravel, dirt, coal, rubble, cinders, kegs, cement sacks, also rolls of building paper and most types of free flowing materials.

Cleats aren't used because the belt cannot be cleaned and the grout adheres and sets up on the cleats and belt. If spool or troughing rollers are used it makes a belt sag between the rollers and the concrete is broken apart and segregated at the high point of the

40% more footage with JAEGER air-plus pressure


With a Jaeger Model 600 to hold them at full pressure, these 4" drills average 4 days' footage in 3 compared with any 500 ft. compressor. Jaeger was first to establish 600 ft. as a standard rating.

Want to cut costs? See your Jaeger distributor or get Catalog JC-1

4 days' work in 3 is possible on many jobs where Jaeger's increased "new standard" ratings step up the speed and hitting power of air tools. A Jaeger 75 will efficiently run one heavy breaker. A Model 125 will run two. Jaeger's 185, 250 and 365 ft. models deliver 25 to 50 cfm more air than "old standard" compressors to run larger tools at full efficiency.

THE JAEGER MACHINE COMPANY 553 Dublin Avenue Columbus 16, Ohio

PUMPS • MIXERS • TRUCK MIXERS • PAVING SPREADERS and FINISHERS

roller or spool. With this type of construction friction is reduced to a minimum and segregation is prevented. Rubber, wood, or plastic scrapers are used to reduce wear.

This method keeps the concrete mixture together at the point of discharge. Numerous washout holes are provided for fast and easy cleaning.

The conveyor will move wet concrete at the rate of 1 to 3 cu. yds. per minute varying with the slump and

elevation of the conveyor. The conveyor is capable of moving material faster than it can be properly handled. It is the only conveyor of its type on the market today that is engineered primarily to handle wet concrete and mortar and is not a conversion of a conventional conveyor. The belt, trough, baffle plate, hoppers, and its series of scrapers are so designed that there is no separation of concrete or mortar nor fouling of moving parts.

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BIGGEST
wire rope jobs . . .

experienced riggers demand
GENUINE
CROSBY CLIPS

Drop-forged, hot-dip galvanized wire rope fasteners
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SIZES FOR ALL WIRE ROPE
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DISTRIBUTORS EVERYWHERE

AMERICAN HOIST & DERRICK CO.
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Utility Basket

Manufacturer: W. T. Lane & Bros., Inc., Poughkeepsie, N. Y.

Claims: A line of canvas baskets for materials handling applications in virtually all fields of industry is offered in six different sizes. The basket withstands severe punishment—even such abuse as being run over—because of a frame design which permits it to regain its shape after being distorted.

Construction features of the basket include double canvas bottom, leather-bound rim, reinforced canvas handles,

tapered sides which permit space-saving nesting when empty, and smooth canvas sides which are snag-free, dust-tight, and light-in-weight.

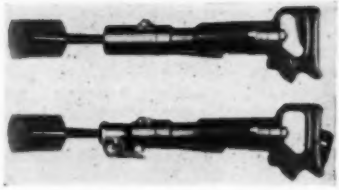
The baskets are made of heavy, long-life duck. Baskets have a round opening for easy filling and emptying, and rectangular sides for easy carrying. Sizes range from one to three bushel capacity.

Clay-Digger

Manufacturer: Independent Pneumatic Tool Co., 175 N. State St., Aurora, Ill.

Claims: A new light-weight Thor pneumatic clay-digger features interchangeable parts to meet every clay digging requirement.

The versatile new No. 16 digger offers optional inside or outside trigger,



closed retainer or latch retainer, choice of five chucks for square, hexagon, or combination hexagon and round shank steels.

The interchangeable features were incorporated into the tool after three years of surveys and field tests.

The new Thor No. 16 weighs 20-lbs., is 19½ inches long and is equipped standard with chuck to take steels with ¾ inch square by 2¾ inch long shanks. Optional chucks take ¾ in. hexagon by 2¾ in. shanks; ⅞ in. hexagon by either 2¾ or 3¼ in. shanks; and combination .882 hexagon and 1.027 round by 3¼ inch long shanks. Accessories available in these shank styles include clay spades or scoops, flat picks, saw tooth chisels, moil points, narrow chisels, and chisel blanks.

All-Purpose Sprayer

Manufacturer: Hanson Chemical & Equipment Co., Beloit, Wis.

Claims: The Brodjet power take-off sprayer is capable of spraying a 44 foot swath on rights of way, roadsides and parks. The sprayer has also proved useful for machinery cleaning as well as truck and car washing. It can be installed or detached in a few minutes

on a tractor, truck or a piece of road maintenance equipment.

The sprayer can be purchased separately or with a Hanson power take-off driven pump and control kit. Two of the featured points are a uniform application and minimum drifting of the spray.

New trade literature

Subject: **Lubrication and Maintenance Guide**

Content: The revised fourth edition of the Gulf Oil Corporation's *Lubrication & Maintenance Guide for Contractors and Allied Equipment*, is a pocket-sized booklet. It contains 96 pages of up-to-date information on the lubrication and maintenance of equipment for quarries, crushed stone plants, sand and gravel plants, asphalt plants, and ready-mixed concrete suppliers, in addition to contractors' equipment. Printed on durable stock with easy-to-read type, the booklet has a plastic spiral binder which facilitates easy turning of pages and ready reference. With technical information contained in the booklet prepared by Gulf's product development and product engineering department, this new guide is not intended to be a substitute for the operator's manual which comes with each new machine. Instead it has the object of giving the operator a better basic understanding of the lubrication and maintenance requirements of construction and allied equipment. The new guide deals with some 45 separate and district lubrication and maintenance items such as engine types, engine lubrication, air cleaners, oil filters, care of carburetors and ignition systems, antifreeze requirements, correct valve maintenance, Diesel fuel injection equipment, chassis lubrication, steering gears, power brakes, and hydraulic systems. The booklet also contains information on the storing of equipment and the removal of equipment from storage, care of tires, dust control, storage battery maintenance, and the storage and handling of petroleum products. The lubrication and maintenance of air compressors, air tools, open gears, wire rope, shovels and draglines, conveyors and elevators, and crushers are also covered in the guide. Of particular interest to owners and operators of equipment are the sections in the guide dealing with A.P.I. classification of motor oils and the recommended oil for use under prescribed conditions, S.A.E. viscosity numbers for crankcase oils, and the S.A.E. transmission and axle lubricant classifications.

Where to get: Gulf Oil Corp.—Gulf Refining Co., 719 Gulf Bldg., Pittsburgh 30, Pa.

Subject: **Engineering Fundamentals**

Content: The *Handbook of Engineering Fundamentals* was prepared by a staff of specialists under the editorship of Ovid W. Eshbach. Eshbach is dean of the Northwestern Technological Institute, Evanston, Ill. The handbook was prepared for the purpose of embodying in a single volume those fundamental laws and theories of science which are basic to engineering practice. It is essentially a summary of the principles of mathematics, physics, and chemistry, the properties and uses of engineering materials, the mechanics of solids and fluids, and the commonly used mathematical and physical tables, to which has been added a discussion of contractual relations. With the exception of the tecnics of surveying and drawing, there is included the fundamental technology common to nearly all engineering curricula.

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KICK THE BUCKET

TO CLEAR IT—IF IT'S A

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Irresistible leverage sweeps out SAND —COAL—GRAVEL, or any granular materials, on every trip—*even if frozen or close-packed.* The secret is the separately mounted stripper-plate—which *must* push up and out when it starts over pulley radius. THOUSANDS NOW IN USE —handling *more* material at same or faster belt speeds. Saves belts—cuts maintenance—easy to install on any elevator conveyor—all sizes.

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standard buckets also available . .

★ SEND FOR PRICES TODAY (give present bucket size)

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It is intended to be of value to both the student and practicing engineer. Although each of the contributors as a matter of course checked the technical accuracy of his material, every section has been read by at least two other competent engineers as an additional precaution. The more important tables were checked against at least two independent sources by different individuals. This is a revised edition of a book previously published in 1936. Although much of the second edition is identical to the first the entire volume has been reviewed and revised as a result of changes in method and greater knowledge.

Where to get: John Wiley & Sons, Inc., 440 Fourth Ave., New York 16, N. Y. ($10.00)

Subject: **Prevent Down Time**

Content: *Prevent Down Time*, urges the title of a new booklet which explains: "Down time is that period when, due to mechanical failure, your equipment is not working and not earning. Valuable time is lost — contract deadlines cannot be met — all because your machine is not in working order." Preventive maintenance, subject of the booklet, has been likened to preventive medicine — both try to reach the "patient" in time to avoid trouble. Picture the equipment serviceman in place of the doctor, and the theme of the story can be seen. Illustrations show how the dealer offers complete facilities for the maintenance of equipment. Earlier booklets of the same series tell how the operator himself can take steps to forestall needless breakdowns. The maintenance program includes routine care by the operator plus expert help from the dealer.

Where to get: Caterpillar Tractor Co., Peoria 8, Ill. (Form 30374)

Subject: **Coal Loader**

Content: A new 8-page bulletin describes a line of coal loaders available with either wheel or crawler mounting. Many on-the-job illustrations are included as well as specifications. The Hi-Capacity coal loaders can move 5 tons per minute. The chassis is of heavy channel and angle members, rigidly braced in every plane. Three point suspension compensates for uneven terrain and permits travel without strain on the chassis structure. A truss-type boom can carry entire digging stress without deflection. The clean-up scraper is pivot-hung from elevator tail shaft and with automatic relief from obstructions. The blade is renewable.

Where to get: George Haiss Mfg. Co., Inc., Division of Pettibone Mulliken Corp., 4700 W. Division St., Chicago 51, Ill.

Subject: **Compaction Equipment**

Content: A new 12-page brochure on the history of pneumatic-tired compaction equipment has just been released. The first section contains a

condensed background of rubber-tired compaction developments in the construction of super highways, heavy duty airfield runways, and giant earth dams. Second section has results of compaction tests conducted at the Oahe Dam project near Pierre, S. D. Also shown are charts describing performance of 35 and 50 ton compactors in various types of fills. Details and specifications on the "Roll-O-Pactor" are in the third section.

Where to get: Road Machinery Division, Wm. Bros. Boiler & Mfg. Co., Minneapolis 14, Minn.

Subject: **Spreader**

Content: A new catalog describes the many features of the recently introduced Buckeye Model 5 spreader. Some of the design and construction features highlighted are the controlled volume and rate of spread. The rate of spread is uniform regardless of the truck speed as the feed roll is powered from the spreader wheels. Feed roll can be adjusted to permit a tapered spread of material. For longer-life and dependable service the wheels are mounted on anti-friction bearings which also reduce rolling friction. Spiral agitator permits the spreading of damp sand. Built in three sizes the No. 5 spreader can be used for base course

"Do you mean that's the shovel you were talking about when we awarded you the contract to dig 2,000 miles of trench?"

spreads by using a strikeoff attachment.

Where to get: Customer Service, Gar Wood Industries, Inc., Wayne, Mich. (Bulletin F-130)

Subject: **Wheel Trenchliner**

Content: A recently issued 4-page bulletin describing features of the new Parsons Model 202 Trenchliner. This is a wheel-type digging unit, designed primarily for drainage and utility trenching work, with a maximum digging capacity of 18½ fpm. Full crawler mounted, the 202 is equipped with either square or round bottom buckets that cut trenches 13 to 31 inches wide, to a maximum depth of 6 feet. Its range of 30 digging feeds extend from 6.2 inches to 18½ fpm. Bucket fronts can be changed quickly from cutting lips to "tap-in" teeth to meet any soil condition. Features incorporated in the Trenchliner for high speed production on drainage, irrigation, municipal and utility trenching projects include: Enclosed friction clutches for accurate control of wheel depth to grade; all-welded unit frame and truck rollers mounted on antifriction bearings; the shiftable and reversible belt conveyor that discharges spoil to either side of the machine; and enclosed main gears running in constant oil bath. A choice of either 52 hp gasoline or 55 hp Diesel engines is offered.

Where to get: Parsons Co., Newton, Ia.

Subject: **Hauling Trailers**

Content: A line of rubber-tired hauling trailers is described in a new 4-page, two-color, cartoon-style booklet. Describing the PD-20, PD-10Q, and PD-10GP, the booklet has over 15 illustrations and carries a theme of two contractors discussing job application and products.

Where to get: Athey Products Corp., 5631 W. 65 St., Chicago 38, Ill.

Subject: **Multi-Plate Pipe**

Content: A new 24-page manual describes large diameter Multi-Plate pipe. This material is described as heavy structural plates formed with extra-large corrugations, curved and galvanized at the plant. The curved plates are delivered to the job in "knocked-down" form for assembly into full-round pipe, arch or pipe-arch. Manual MP-1652 explains engineering and design features, tells where and how to use it, and illustrates a wide variety of installations. There is a section on technical data with charts, tables and graphs, and a check-list of the company's other products.

Where to get: Armco Steel Corp., Middletown, O.

Subject: **Canal Linings**

Content: A new Bureau of Reclamation publication *Canal Linings and Methods of Reducing Costs* has been issued. The booklet, describing six years of bureau experimentation and research on the canal lining problem, points out that at the 25% seepage rate on unlined canals and laterals in 1949, the 3,900,000 acre-feet of water lost on 46 federal projects would have been more than enough to irrigate an additional one million acres of land for crop production. An ideal canal lining, says the 70-page booklet, would be watertight, be moderate in cost, prevent the growth of weeds, resist the attack of burrowing animals, be strong and durable, be adaptable to the construction of a shape and finish pro-

MOVE MORE YARDAGE... at less COST!

Big Excavations Handled in One Operation by a

SAUERMAN SCRAPER

Hill of volcanic ash 250 ft. high is moved by 3-cu. yd. Sauerman Scraper which loads the material into cars using a simple ramp.

In far northern Alberta, Canada, valuable tar sands are dug from a river bluff by a 1-cu. yd. Sauerman scraper.

Here is a small Sauerman Scraper cutting down a bank of clay which it hauls 300 ft. to brick plant.

Many difficult dig-and-haul jobs, such as the three illustrated here, are reduced to simple terms and big savings effected by use of a Sauerman Drag Scraper machine.

An exclusive feature of the Sauerman Machine is the unique Crescent bottomless scraper bucket. Because of its streamline design, the "Crescent" penetrates hard materials with the ease of a plowshare, gathers a full load in a few seconds, then rides its load to the dumping point where it makes an instantaneous, clean dump. Twenty to forty or more heaping loads moved per hour, the exact number of round trips of the scraper bucket depending upon the length of the operating span.

The operator, sitting in a comfortable control station, easily guides the scraper over a large area. Automatic shifting of the tail end of the machine is provided where desired. Power requirement is moderate. Installation and upkeep costs are low. Sizes from ½ cu. yd. to 15 cu. yd. cover the needs of all material handling jobs—large or small.

Write for new illustrated Catalog A.

Rope Haulage Equipment Specialists Since 1909

SAUERMAN BROS., Inc.

574 S. Clinton St. Chicago 7, Ill.

viding maximum hydraulic efficiency, and have a reasonable amount of flexibility. No canal lining material now in use possesses all of these characteristics, but each possesses most of them to a greater or lesser degree. The desired characteristics of a lining for a particular job will depend on the problems encountered, and the type of lining will be selected which most nearly meets those requirements. Since 1946, more than 24 million square yards of lower cost linings have been placed in 611 miles of new and existing canals. Annual savings in water as a direct result of lining these canals are estimated at 706,000 acre-feet, with a value of $1,609,000, and reductions in annual maintenance costs estimated at $660,000. About 5,900 acres of waterlogged land, with an estimated value of $903,000, have been reclaimed since 1946 by lining of existing canals with lower-cost linings and about 9,100 additional acres, with an estimated value of $1,345,600, have been prevented from probable waterlogging by lining of new canals with lower-cost linings since 1946. Private business concerns, donating time, equipment and materials without cost to the government, rendered valuable co-operation in the research program and several state agricultural experiment stations joined in the bureau investigations.

Where to get: Superintendent of Documents, United States Government Printing Office, Washington 25, D. C. (25c)

Subject: **Portable Cutting Tools**

Content: Ranging from economical, light-weight hand cutters to larger, high-capacity bolt cutters, a complete line of hand-operated units for cutting steel rod, wire, fence, steel strapping, high tension wire, and a wide variety of other materials is offered in this catalog. Photographs and specifications accompany each model described in this 2-color, four-page catalog.

Where to get: Manco Mfg. Co., Bradley, Ill.

"Look at the big showoff! There's a steel girder in the concrete he's standin' on."

Subject: **Compressors**

Content: A new 4-page bulletin describes all types of 105 cfm Davey compressors. Gasoline, Diesel, and electric-powered trailers; "Auto-Air" truck-mounted units and industrial stationary machines are listed and illustrated in detail. Complete mechanical specifications are included in a reference table.

Where to get: Davey Compressor Co., Kent, O. (Form E-237)

Subject: **Data Book**

Content: Newly revised data books on many engineering subjects in various fields is announced by the publishers of the Dollar Data Book series. Partial listing includes: Architecture; building construction and design aids; reinforced concrete; steel forms and shapes; and surveying theory and practice. The book contains about 140 loose leaf pages of up-to-date material arranged for ready reference.

Where to get: Lefax, Philadelphia 7, Pa. ($1.00)

Subject: **Tractor Equipment**

Content: This comprehensive guide illustrates the use of tractor-mounted tools in basic industries such as construction, light and heavy logging, mining, oil and gas, and governmental projects. Entitled, *A Story of Tractor Tools and Their Uses*, it is printed in four colors. The 16-page brochure uses a cartoon-style which presents many of the principle uses for this type of equipment.

Where to get: Hyster Co., 2903-05 N. E. Clackamas St., Portland 8, Ore.

Subject: **Scales**

Content: A new 28-page condensed scale catalog has just been released. It includes a selection of a thousand popular standard Howe scales weighing from 1/64th of-an-ounce to 400 tons. Crane dial and motor truck scales are presented in the catalog. A compact edition of the complete catalog of 200 pages, the new condensed scale catalog includes complete specifications, spot illustrations, and essential information. A simple index makes it easy to find any scale.

Where to get: The Howe Scale Co., Rutland, Va. (Catalog No. 11)

cut tonnage costs

with P&H ELECTRIC SHOVELS

In more and more locations these ultra-modern P&H machines are taking over the jobs that call for big production — steady digging. Users who know their cost accounting come back for more — for one proved reason . . . *lower tonnage costs.*

Contributing factors are these:

P&H Magnetorque* Hoist Drive powers hoisting motions electro-magnetically, gives you snappier dipper action — eliminates hoist generator, slip friction clutch and other troublesome mechanical devices.

P&H stepless power regulation is smooth and accurate — with no control fingers or contactors to give you trouble.

Independent propel, all-welded construction, filtered air cab and other modern refinements have led the way to more dependable production on a year-in, year-out basis.

If you seek lower tonnage costs in open pit work, let us tell you where you can see a P&H Electric Shovel in action. Ask about a P&H today.

*T.M. of Harnischfeger Corporation for electro-magnetic type clutch

Every third P&H Electric Shovel sold is a repeat order

HARNISCHFEGER CORPORATION

4517 West National Avenue • Milwaukee 46, Wisconsin

POWER SHOVELS • CRAWLER AND TRUCK CRANES • OVERHEAD CRANES • ARC WELDERS AND ELECTRODES • SOIL STABILIZERS • DIESEL ENGINES • PRE-FABRICATED HOMES

Notes from the manufacturers

Allis-Chalmers Manufacturing Co., Milwaukee 14, Wis., announces a new building program costing more than $3 million to be started soon at the LaPorte, Ind. works, tractor division in connection with the production program of the M-8E2 Army cargo tractor. A building for manufacturing and storage with 210,000 square feet will be built, and an addition will be made to the boiler house. While a good share of the manufacturing of the army vehicle is in a $2.5 million building constructed in 1951, some space had to be taken in other buildings at the La Porte Works to install machine tools for production of the M-8E2. The new building will compensate for loss of this area and provide needed storage space.

American Brake Shoe Co., New York, N. Y., has appointed Robert C. Carruthers assistant sales manager, welding products, of American Manganese Steel Division, at Chicago Heights, Ill. Carruthers is a graduate of Massachusetts Institute of Technology. He started with American Brake Shoe in 1950 as metallurgical assistant, and was sales development engineer with American Manganese Steel Division prior to his appointment as assistant sales manager. He is a member of the American Foundrymen's Society, the American Welding Society and the American Institute of Mining and Metallurgical Engineers.

STEP UP DRILLING PRODUCTION WITH THIS "HAPPY COMBINATION"

IF you want increased production in blast hole drilling operations, use a Bucyrus-Erie one-piece combination stem and swivel socket in your rig's tool string. A large diameter section with no joints, this tool speeds up drilling by eliminating vibration or whipping of the stem in the drill hole. One less joint means easier maintenance, greater convenience too. Write today for complete information on this and other Bucyrus-Erie drilling and fishing tools.

BUCYRUS ERIE

SOUTH MILWAUKEE, WIS. 18A51

Caterpillar Tractor Co., Peoria, Ill., recently held an open house preview of the new Joliet plant. Bulldozers, rippers, wagons, scrapers, and cable controls are manufactured in the new plant. Caterpillar, like some other manufacturers in the heavy machinery business, faced a difficult parts problem over the past six years, because of the heavy sales of prime products. The increase in the number of units in use resulted in a gradual increasing demand for parts. While the major portion of this parts demand was handled in the normal routine of business operations, there were certain critical parts that on some occasions developed a lag. The answer to this important sales problem was the tremendous expansion of activities at Peoria and at Joliet, and additional construction to take place at York, Pa. This total expansion program is costing in the neighborhood of $35 million, of which a substantial portion is being spent at Joliet. Thus the production at the Joliet plant helps to resolve two sales problems: (1) that of providing a market demand, (2) that of providing necessary parts. Land was purchased for the plant in February, 1950 and construction started August, 1950. Production at the 305 acre site started on the 12th of February, 1951. More than 6,000 gals. of paint are used each month on this plant housing 697,040 sq. ft. About 3,600 persons are employed receiving a current payroll in excess of $1.25 million a month.

Cleaver-Brooks Co., Milwaukee 12, Wis. announces the appointment of the Mason Equipment Co., Toledo, O., as a manufacturer's representative for the sale of Cleaver-Brooks boiler equipment. The firm is located at 2281 Wildwood Blvd., Toledo. Its territory will include nine counties in northwestern Ohio. Cleaver-Brooks manufactures equipment for the generation and utilization of heat. Among its products are mobile steam boilers; oil fired, gas fired and combination oil and gas-fired boilers; distillation equipment; hot water generators, and bituminous heating equipment.

Euclid Road Machinery Co., Cleveland, O., has elected Stewart F. Armington chairman of the board. He succeeds his father, G. A. Armington, who was elected honorary chairman after serving as board chairman ever since the company was formally incorporated in 1931. Stewart Armington, one of the founders of the company, steps up to the chairmanship from vice president. G. E. Armington succeeds Stewart Armington as vice president, engineering, and Hugh T. Monson was elected vice president, manufacturing. Monson, with the company since 1936, has been factory manager. He served as first managing director of Euclid (Great Britain), a company subsidiary in Scotland which was established in 1950. E. H. Newby was elected vice president, controller. He has been with Euclid 16 years and has served as advertising manager and personnel director. Other officers re-elected are R. Q. Armington, president, E. F. Armington, vice president, sales and secretary, and J. L. Hinckley, treasurer.

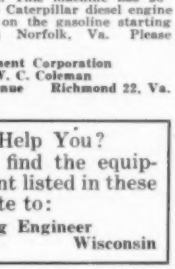
Gar Wood Industries Inc., Wayne, Mich., announces a series of appointments. H. H. Hippler has been named assistant director, sales and advertising. R. F. Whitworth, formerly sales manager, national accounts, has been named to succeed Hippler as manager of the branch division. At the same time, the appointment of Ross Miller was announced to the position of vice president and general manager of National Lift Co., Waukesha, Wis., a Gar Wood subsidiary. Hippler joined the company in 1924 as a stock clerk at the Detroit branch. In 1929, he was named assistant manager of the Boston branch and in 1947 became manager of the branch. Hippler became manager of the branch division in 1949. Miller started in 1920 and has served with the company branches in Philadelphia, Baltimore, and in San Francisco where he was branch manager. In 1943, he was appointed service manager and before becoming Chicago branch manager, he was west coast regional manager. Whitworth, a graduate of the University of Michigan and colonel in charge of the Detroit Ordnance Depot during the war, joined the company in 1946 as division sales coordinator. In 1947, he was named manager, general sales department and in 1950 became manager of national account sales.

General Electric, Schenectady 5, N. Y. will build a multi-million-dollar transformer manufacturing plant at Rome, Ga., providing employment

TO ADVERTISE: All advertising in this section is payable in advance. Rate: $1.00 per line, or $12.00 per inch of 12 lines. Minimum charge $4.00. No discounts; no commissions. Please count your copy carefully to avoid delay. Each line contains 41 characters (34 characters if all capital letters are used). Count spaces and punctuation as one character each. Allow 10 characters for box number, if blind advertisement is desired. Be sure to enclose the correct amount of money with your order. Closing date—15th of preceding month. Example: January closes December 15th.

TO INQUIRE: Be sure to address your inquiry to the advertiser by using the correct box number. Mail your letter in care of Excavating Engineer, South Milwaukee, Wisconsin. Write each advertiser a separate letter. Do not write us for name and address of advertiser. This information will not be given out. We have no information about the equipment advertised other than that shown in the advertisements themselves.

SMALL SHOVELS, CRANES AND DRAGLINES UP TO 2¼ YDS.



Osgood Model 260 size 1½-yd. shovel and crane including fairleads equipped with Buda gasoline engine. Machine Serial No. 3328.

Box 3483

Bucyrus-Erie 33-B. Equipped as clamshell and dragline with 50' boom, high A-frame, independent boom hoist, no drag bucket or clamshell bucket included. This machine has 26" treads and a D-11000 Caterpillar diesel engine with electric starter on the gasoline starting engine. Located in Norfolk, Va. Please contact:

Bemiss Equipment Corporation
Attn: Mr. W. C. Coleman
2219 Chamberlayne Avenue Richmond 22, Va.

May We Help You?
If you do not find the equipment you want listed in these columns, write to:
Excavating Engineer
South Milwaukee Wisconsin

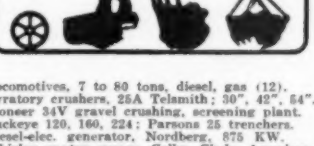
Northwest model 25; 6; 80D; 95. Manitowoc 6500; 4500 new — will rent. Bucyrus 54-B; Morigban 5W; 7W; 9W; 450.
A. W. Nevers Phone 32 Mt. Pleasant, Iowa

We Specialize
On Exclusively Used

mechanically sound, late model diesel Bucyrus-Erie and Northwest shovels, cranes, draglines and pullshovels. Our list of Bucyrus-Erie 15-B's, 22-B's, 38-B's and 54-B's and Northwest 25's, 6's, 80-D's and 95 machines is the most complete and comprehensive inventory of used machines of these models available. We also list walking draglines and all attachments.

J. C. French Company
226 Berry Parkway Park Ridge, Illinois
Tel. TAcott 3-4927

MISCELLANEOUS EQUIPT.



Locomotives, 7 to 80 tons, diesel, gas (12). Gyratory crushers, 25A Telsmith; 30", 42", 54". Pioneer 34V gravel crushing, screening plant. Buckeye 120, 160, 224; Parsons 25 trenchers. Diesel-elec. generator, Nordberg, 875 KW. Whirley gantry cranes, Colby, Clyde, American. Dryers, kilns; 54"x40', 74"x47', 9'x10'x170'. Shovels, draglines, cranes, 1½-yd. to 10-yd. Walking draglines, 15W, 9W, 3T, diesel, elec. Floating derricks, 30 and 15 tons, steam. B-Erie shovel front att., 2½ yd., 52B-55B.

H. Y. Smith Co., 828 N. B'way, Milw. 2, Wis.

TWO HYDRAULIC DREDGES

(For Sale to Close Estate)

1—12" 500 H.P. G.M. DIESEL DRIVEN
150 H.P. G.M. DIESEL DRIVEN
MORRIS MANG. PUMP
35' LADDER
44" CUTTER
COMPLETE OUTFIT
1—15" 900 H.P. G.M. DIESEL DRIVEN
150 H.P. G.M. DIESEL DRIVEN
MORRIS MANG. PUMP
MUNDY 5 DRUM HOIST
6 BLADE BASKET CUTTER

NOW WORKING—CAN BE INSPECTED ON JOB FOR COMPLETE SPECS. AND INFORMATION:

WALTER MAGEE ESTATE
1397 LAUREL AVE. ST. PAUL 4, MINN.

ALLIS-CHALMERS, Model HD-19 tractor with Gar Wood cable control tipdozer and double drum control unit.
BUCYRUS-ERIE 22-B shovel, dragline, and lifting crane.
CATERPILLAR, Model D-8 tractor with LeTourneau cable tipdozer.
NORTHWEST, Model 25 dragline with 40' boom and IHC engine.

For further information, contact
E. F. Craven Company
P.O. Box 538 Greensboro, North Carolina

NEW BELT CONVEYOR IDLERS
2000—30 & 36 IN. TROUGHING 6" ROLLS
1400—42 IN. TROUGHING 6" ROLLS
100—60 IN. TROUGHING 6" ROLLS
600—30 & 36 IN. RETURN 5" ROLLS
450—42 IN. RETURN 5" ROLLS
25—60 IN. RETURN 5" ROLLS
ALL ABOVE FITTED BALL BEARINGS.
30 COMPLETE NEW TERMINAL SETS WITH LAGGED HEAD PULLEYS
DARIEN CORP., 49 E. 41st St., New York 17, N.Y.

Shovel front complete for Model 10-B Bucyrus-Erie. Good condition. S-1970 (B). SALE PRICE F.O.B. LOUISVILLE, KY. $850
Northwest Model 104 1-yd. shovel with heavy duty Amaco rock bucket, General Motor diesel engine 3-71 std. treads crawler mounted. Good operating condition. S-2060 (B). SALE PRICE F.O.B. LOUISVILLE, KY. $6000

Brandeis Machinery & Supply Co.
Brook & Warnock Sts. Louisville 8, Ky.

Completely rebuilt standard bucket for 54-B, with bail and sheave, and
Counterweight (one piece) for 54-B.
Immediately available at considerable saving.

H. O. Penn Machinery Company, Inc.
140th Street and East River
New York 54, New York

Five Bucyrus-Erie 29-T drills, 440 v., 3 phase, 60 cycle, electric power, complete with tools and a stock of spare parts. Also one Bucyrus-Erie No. 12 bit dresser. Location: Middle West. Box 3482

3—Buda HP-326 gasoline engines, 6 cylinder, 3-3/16" x 4¾", Governor set @ 1600 R.P.M., complete with fittings. Bargain price $650 F.O.B. South Milwaukee, Wisconsin.

Bucyrus-Erie Company
South Milwaukee Wisconsin

Complete dragline equipment including 80-foot boom and 4-yard bucket removed from Bucyrus-Erie 120-B Serial No. 11572. Excellent condition. Price $12,000 F.O.B. Napa, California.

Basalt Rock Company
Napa, California

SAVE ON WIRE ROPE

Immediate Shipments from Stock

NEW 9/16" 6x7 Hemp center, Regular lay, Black, Non-preformed, Sand Lines in 6000 ft. reels **14¢ per ft.**

NEW ⅞" 6x19 Hemp center, Left lay, Black, Non-preformed Drill Lines in 6000 ft. reels **31¢ per ft.**

UNUSED SURPLUS 1" 18x7 Hemp center, Regular lay, Black, Plow Steel in 152, 182, 200 and 273 ft. reels **26¢ per ft.**

WIRE ROPE SLINGS—EXCELLENT CONDITION 1½" x 15 ft.—18" Eye each end, 6x19, Galvanized Plow Steel **$6.50 ea.**
1" x 15 ft.—6x19, Plow Steel **$3.00 ea.**

Prices FOB Shipping Point—Freight allowed to destination on shipments of 200 lb. or more. All items subject to prior sale.

Try us for All Sizes and Constructions of Wire Rope

LB FOSTER CO.

PITTSBURGH 30, PA. NEW YORK 7, N. Y.
CHICAGO 4, ILL. HOUSTON 2, TEXAS

Continued on page 72

For Sale

Continued from page 71

USED EQUIPMENT

BUCYRUS-ERIE Model S-90, 4-wheel 8 to 10 yd. scraper.
ALLIS-CHALMERS Model HD-14C tractor with Gar Wood hydraulic control unit.
ALLIS-CHALMERS Model AD motor grader powered by a GM 3-cylinder engine.
CATERPILLAR Model D-8 tractor with LeTourneau cable tip dozer.
For further information, contact
E. F. CRAVEN COMPANY
Phone 3-5521 P.O. Box 538
Greensboro, N. C.

One used Bucyrus-Erie 10-B Shovel front attachment. Good condition.
The Bode-Finn Company
2650 Spring Grove Avenue
Cincinnati 14, Ohio
Mulberry 2200

Two 1949 KB-8 International dumps with bodies in excellent condition, $3000 each. Riemer Brothers, Inc., 6301 West Fletcher Street, Chicago, Illinois. National 2-3636.

HELP WANTED

OFFICE ASSISTANT

Position available for a young man with two years or more of Engineering training and some field experience with excavating machinery. Duties will include the preparation of written copy for printed instruction books, also correspondence with field personnel. Technical writing experience helpful but not necessary. Position located in middle west. State age, experience and salary expected. Reply to Box 3476 in care of Excavating Engineer.

Walking dragline operator required to train new operators and supervise manual handling of new 8 cu. yd. Bucyrus-Erie walking dragline being used in open pit mining operations in British Guiana. Established community staff mainly North Americans. Salary payable in United States dollars. Give full details, past experience, marital status, salary expectations. Box 3480

POSITION WANTED

Position wanted as shovel, dragline, clamshell or pile driver operator. Have operated gas, steam and diesel large and small machines. Prefer steady work. P. O. Box 8, Hurricane, West Virginia. Phone 2224-Hurricane.

If you are Buying or Selling Used Equipment this is the place to let the Excavating Industry know about it.

for about 1,700 persons. Construction will begin at once and will be completed by mid 1953. The plant will consist of two large manufacturing buildings, an office building, and a number of outlying service buildings, all constructed of steel and transit siding. Production at the new plant will begin immediately following its completion, with full production capacity expected to be achieved in 1955. Some classes of power transformers and large distribution transformers, representing a total of 5.5 million kilivoltamperes or the equivalent of 7,333,000 hp of electrical energy, and expected to be produced annually at the new facilities.

Joy Manufacturing Co., Pittsburgh, 22, Pa., has announced the election of William L. Wearly to the post of general sales vice president in charge of all domestic sales including Canada and Mexico. Wearly joined the engineering department of Joy in 1937 and has served successively as service manager and vice president, coal machinery sales. A native of Indiana, he graduated from Purdue University in 1937 with a B.S. degree in electrical engineering.

Jahn Trailer Division, Pressed Steel Car Co., reports that the division sales office has been moved to its Hegewisch plant at 136th St. and Brandon Ave., Chicago 33, Ill.

Koehring Co., Milwaukee, Wis., announced the organization of another subsidiary company, known as Koehring Southern Co. This move has been made to provide increased facilities for the development and manufacture of new models of power shovels and cranes. It will not affect the present schedule of manufacture of construction equipment in the main Milwaukee plant. The Koehring Southern Co. has purchased the Chattanooga, Tenn., plant of the Norge Division of Borg-Warner Corp. Purchased for about $500,000, the Chattanooga property consists of a modern factory 800 feet long and 120 feet wide, with a total of 100,000 sq. ft. of floor space, including auxiliary buildings. Located on a 17-acre site, the Chattanooga plant is served by rail, water, and highway transportation. Koehring Southern Co. plans to spend approximately $1 million for machine tools to equip the huge building for new-product manufacture. It probably will be early next year before the Chattanooga unit can be placed in full operation, although production operations will be under way in two to

Schield Bantam Co., Waverly, Ia., has appointed A. Frank Landolt as district sales manager for a newly created sales district covering California, Utah, Nevada, Arizona, New Mexico, Colorado, and sections of Wyoming and Texas. Landolt for the past five years has been affiliated with a distributor organization in Texas who handled the Schield Bantam line of truck-mounted power cranes and shovels. Landolt is now setting up headquarters in San Francisco, Calif.

Wood Manufacturing Co., North Hollywood, Calif., has appointed A. W. Ginther general sales manager. For the past fifteen years, Ginther was with the Harnischfeger Corp., as Los Angeles district manager, which post he left to join Wood. He is an engineering graduate of Purdue University. Wood products include mixers, preparizers, windrow proportioners, spreader boxes, cement distributors, and tank trailers.

Worthington Corp., Harrison, N. J., has appointed J. R. Hutchison regional manager for the Middle East. He will manage activities in Cyprus, Egypt, Greece, Iran, Iraq, Israel, Lebanon, Syria, Trans-Jordan, and Turkey. An 18-year Worthington veteran, Hutchison has served successively as application, sales and then field engineer in pump, priorities, compressor, and export departments. More recently he has served as a compressor specialist in the export department. He received his B.S. degree in mechanical engineering at Newark College of Engineering, Newark, N. J. in 1943 and is a member of the American Turkish Society, Inc. of Ankara and New York City. Hutchison will be headquartered at Emlak Cadessi 20/3, Istanbul, Turkey.

"and then if you want the shovel to . . ."

Another Example of Efficient Power at Lower Cost

This new Cooper-Bessemer-powered 200-W Bucyrus-Erie walking dragline, owned by Miami Crushed Stone Co., Miami, Fla., is shown digging unshot limerock from a 24-foot pit at the rate of 300 yards per hour. The engine is a dependable Cooper-Bessemer Type GS rated 385 bhp.

COOPER-BESSEMER DIESELS . . .

. . . noted for "digging in" — without complaint!

FOR example . . . President G. D. Monroe of the Miami Crushed Stone Company has this to say . . .

"This machine is digging an oolitic formation, and it is doing a good job without the rock having to be drilled and shot. We are very much delighted with the performance of your engine, and the whole machine for that matter."

If you have a power job coming up—mobile or stationary—Cooper-Bessemers can help you keep costs down, production up! They're designed and built that way. So get all the facts on these modern engines before going ahead with that next powering job of yours.

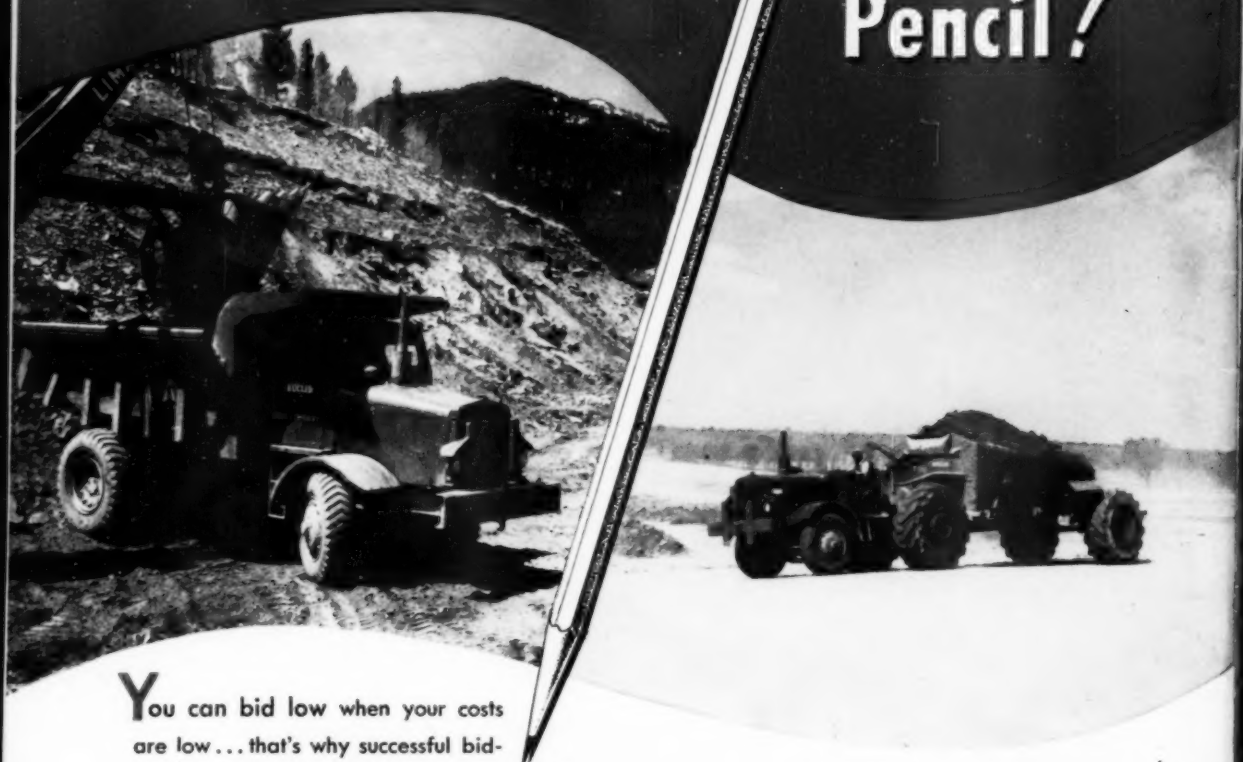
The **Cooper-Bessemer** *Corporation*

MOUNT VERNON, OHIO — GROVE CITY, PENNA.

New York Washington, D. C. Bradford, Pa. San Francisco Houston, Dallas, Greggton, Pampa and Odessa, Texas Seattle Tulsa Shreveport St. Louis Los Angeles Chicago Caracas, Venezuela Cooper-Bessemer of Canada, Ltd., Halifax, Nova Scotia Gloucester, Mass. Calmes Engineering Co., New Orleans, La.

When you bid...

"Eucs" beat a Sharp Pencil!



You can bid low when your costs are low... that's why successful bidders on hundreds of off-the-highway earth moving jobs base their estimates on the performance of Euclids.

On construction, mining and industrial work, job records prove that Euclids step up production and cut costs. Large capacity, high travel speed and day-in and day-out availability are some of the reasons why "Eucs" haul more loads per hour at less cost per load.

Ask your Euclid distributor for help in estimating earth moving costs for your next bid ... or write direct for literature and the new edition of the Euclid estimating manual.

Bottom-Dump Euclids—13 to 25 cu. yds... 190 to 300 h.p.... top speeds loaded to 34.4 m.p.h.

Rear-Dump "Eucs"—10 to 34 tons...125 to 400 h.p. ... spring mounted or semi-rigid drive axles... top speeds loaded to 36.3 m.p.h.

The EUCLID ROAD MACHINERY Co., Cleveland 17, Ohio

CABLE ADDRESS, YUKLID. CODE: BENTLEY

EUCLIDS *Move the Earth*